Oregon's Mileage Fee Concept and Road User Fee Pilot Program

Report to the 73rd Oregon Legislative Assembly

On proposed alternatives to the current system of taxing highway use through motor vehicle fuel taxes

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Oregon Department of Transportation
www.oregon.gov/ODOT/HWY/OIPP/ruftf.shtml

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PREFACE

The first question people ask about the pilot program for mileage fees is, "Why are you doing this?" The answer is simple. Oregon is preparing for the day when a substantial number of motorists are driving highly fuel efficient vehicles and no longer paying enough gasoline taxes to support their road system. With rising oil prices and more people buying the new technology vehicles, that day may come about ten years from now. No one in Oregon proposes immediate implementation of an electronically collected mileage fee. Investigation and preparation for a new revenue system, however, is warranted because of the long lead time necessary for any change.

The next question asked is, "Why did you choose the per-mile charge?" This answer is also fairly simple. The 2001 Oregon Legislative Assembly established the Road User Fee Task Force to recommend a potential replacement for the gasoline tax (which was deemed likely outmoded in the not too distant future). The task force determined that a new road revenue system based on a properly designed per-mile charge would not be vulnerable to motorists obtaining increasingly fuel efficient vehicles in response to rising prices at the gasoline pump. As administrator of the task force, the Oregon Department of Transportation determined that a per-mile charge could be collected efficiently (through modern technology) and inexpensively. The task force agreed and concluded the per-mile charge to be a real, practical alternative to the current road revenue system. This document reports what the task force and ODOT have learned since issuance of its first report to the 2003 Oregon Legislative Assembly.

This report has several purposes. First, we make a case for developing a new funding mechanism for our road system, an ultimate replacement for the gasoline tax (see Chapter 2). Second, we fully describe the Oregon mileage fee concept for the first time in print (although we have done so for the media and in national presentations on numerous occasions over the past two years) and lay out numerous policy choices for alternative mileage fee configurations (see Chapter 3). Third, this report satisfies the statutory obligation to describe the progress on development of a Pilot Program for demonstrating the feasibility of the Oregon mileage fee concept (see Chapter 4).

We have always known that implementation of the mileage fee would be difficult because of the potentially broad application to all motorists driving passenger cars. Any public policy applied broadly always draws intense speculation and opposition. We are hopeful this report dispels much of the rhetorical argumentation surrounding this debate and replaces the inaccurate assumptions and myths upon which it relies with factual information.

In the summer of 2003, we determined the only way to begin to address the impending road revenue crisis and to create the potential for adoption of the mileage fee somewhere in this nation (or another nation) was to create a national debate on the issue. We are pleased this debate has begun and has even spread internationally. We are hopeful this report will help focus this debate on the real issues and, therefore, enable consideration of the Oregon mileage fee concept on its true merits.

James M. Whitty
Salem, Oregon
June 2005

ACKNOWLEDGEMENTS

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The authors thank the following contributors to development of the concept and Pilot Program:

- Members of the Road User Fee Task Force, past and present, for vigorous policy debates, patient attention to extensive research presentations, courageous decision making and ultimately development of the Oregon Mileage Fee Concept.

- The Technical Advisory Committee, including Darel Capps, ODOT Fuels Tax Group Supervisor, Jack Svadlenak, ODOT Economist and Norman (Chuck) Larsen, ODOT ISB ITS Program Coordinator, for groundbreaking policy analyses and conceptual thinking for the Oregon Mileage Fee Concept and ongoing dedication to this project.

- Researchers Anthony M. Rufolo, PhD and Robert L. Bertini, PhD of Portland State University for providing critical data analysis to the Road User Fee Task Force.

- Pilot project managers Benny Sexton of ODOT ISB, Joe Brookhouse, formerly of The Gault Foundation, Jill Pearson of ODOT Office of Innovative Partnerships and Alternative Funding, Mark Ford of HDR Engineering, Inc. and Doug Hall of The Gault Foundation for significant contributions to development of the Road User Fee Pilot Program.

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Special recognition goes to the Oregon State University School of Engineering, its faculty, especially David S. Kim, PhD and J. David Porter, PhD, and graduate students who developed the mileage fee technology and endured many hours of field testing, public demonstration of the technology and tours for policy makers, interested parties and members of the media.

Finally, we thank the Value Pricing Pilot Program and Oregon Division of the Federal Highway Administration for counsel and support without which our effort would never have commenced.

EXECUTIVE SUMMARY

CONTENTS AND PURPOSE OF THIS REPORT

This document reports on progress made since previous reports to the State Legislature in September 2002 through May 2005 by the Oregon Department of Transportation (ODOT or ODOT) Office of Innovative Partnerships and Alternative Funding (OIPAF) in fulfilling the mandate of Oregon House Bill 3946 (2001). That legislation directed the Governor, Senate President and Speaker of the House to form a Road User Fee Task Force (Task Force) with the charge to design a revenue collection strategy that can effectively replace the gasoline tax in order to provide a long-term, stable source of funding for maintenance and improvement of Oregon's road system. The legislation also requires ODOT to staff the Task Force and to develop, design, implement and evaluate Pilot Programs to test the fuels tax alternatives identified by the Task Force. This report details important milestones along the way to developing an implementable alternative road revenue system and related Pilot Program, along with sufficient supporting analysis and explanation of outstanding technical and policy issues, to permit legislators to make their own assessment of program efficacy.

OREGON'S GAS TAX IS FAILING TO ACHIEVE ITS ORIGINAL PURPOSE

In 2005, fully 80 percent of Oregon's road revenues will depend on gasoline taxes, either directly or indirectly. This key revenue source, however, is in increasing peril. Table ES-1 highlights the disjunction between population, economic growth and road usage on the one hand, and gasoline tax revenues on the other. By 2003, the gasoline tax revenue in "cents per vehicle mile traveled" (after subtracting inflation) had *declined by half* since 1970. The gasoline tax is failing the purpose for which it was originally intended – funding the operation and maintenance of Oregon's road system.

The existing funding gap will be compounded by rapidly developing fuel efficiency improvements for conventional vehicles, market penetration of innovative vehicle technology and the development of non-gasoline fuel sources. As a result, economists predict that Oregon fuels tax revenues from the sale of gasoline are likely to level off during the period 2017 to 2023 and then drop permanently.

Table ES-1: Oregon Demographic, Income, VMT and Gas Tax Data

Oregon Statewide Data	Population	Real Per Capita Personal Income ($2003)	Statewide Vehicle Miles Traveled (Billions)	VMT Per Capita (miles)	Total Gasoline Tax Revenue (Millions $2002)	Gasoline Tax Revenue in Cents per VMT ($2002)
1970 Data	2,091,533	$18,606	11.55 B	5,524	$266.33	2.31 cents
2003 Data	3,541,500	$28,734	31.36 B	8,855	$362.69	1.16 cents
Percent Change 1970-2003	69%	54%	171%	60%	36%	(50%)

Source: ODOT Office of Innovative Partnerships and Alternative Funding (June 2005)
See Appendix B of this report for detailed data tables and sources.

SEEKING REPLACEMENT REVENUE SOLUTIONS FOR OREGON

The Road User Fee Task Force recommended two market-based user fees as the fairest and most stable replacements to the gasoline tax:

- **Mileage Fee**
  A mileage fee is a distance-traveled charge imposed according to the amount a vehicle owner/operator uses the road system. The Task Force intends that a mileage fee would ultimately replace the fuels tax as the principal revenue source for Oregon's roads.

- **Congestion Pricing** (also known as "peak period pricing" or "value pricing")
  Congestion pricing charges the owner/operator of a motor vehicle a fee for using certain roadways during periods of high congestion. Congestion pricing would apply only to areas with the most congested roads and at the most congested times.

ADDRESSING CHALLENGES IN DEVELOPING A ROAD USER FEE PILOT PROGRAM

Since 2003, the Task Force further developed the mileage fee and congestion pricing concepts of the new revenue system. The Task Force now finds the mileage fee system, as conceptualized, to meet all the policy requirements set by the Task Force, including the following major issues:

- **Privacy Guaranteed**
  Motorists' privacy would be protected by a design for the data transmission technology that would eliminate any possibility that their movements could be transmitted to or in any way tracked by ODOT or a third party.

- **Cautious 20-Year Phase-In Ensures System Reliability & Accountability**
  During the two-decade phase-in period, the state will operate both the fuels tax and the mileage fee. This seamless transition period ensures that no Oregon motorist would be responsible for paying both, but no road user would evade paying their fair share. Nonresidents and motorists driving vehicles without the necessary technology would continue to pay only the Oregon fuels tax. Administrative systems between ODOT, wholesalers and retail service stations would ensure stable and reliable road financing and would include the ability to identify potential discrepancies.

- **Lowest Cost Strategies**
  Electronic odometers would be required only for new vehicles that will likely contain the necessary technology. No vehicle currently in use would be retrofitted. At the time of statewide implementation of a mileage fee, it is expected that all new vehicles will be equipped with the proper technology.

- **Affordable and Technically Practical**
  ODOT's researchers at Oregon State University School of Engineering publicly demonstrated on May 14, 2004, the feasibility of the mileage fee technology for data collection and transmission and fee collections. ODOT's analysis has determined the Oregon mileage fee concept to be affordable as well as feasible.

- **Minimal Burden on Private Sector**
  Retail service stations would feel little, if any, change from administrative requirements associated with the existing gasoline tax.

- **Timeline**
  The Road User Fee Pilot Program will take place in Portland, Oregon, from March 2006 to March 2007. A final report and evaluation will be completed in 2007.

CHAPTER 1
INTRODUCTION

1.1 THE ROAD USER FEE TASK FORCE

1.1.1 Background and Historical Rationale

Beginning in 2001, in response to a growing roadway funding gap, and pursuant to a mandate from the Oregon State Legislature[1] and supporting grants from the Federal Highway Administration's Value Pricing Pilot Program[2], the Road User Fee Task Force (Task Force) examined 28 revenue alternatives for replacing the fuels tax as the primary source of revenues for Oregon's roads. The Oregon Department of Transportation (ODOT or ODOT) administers the Task Force. The Legislative Assembly adopted the following statutory purpose for the Task Force:

> "… to develop a design for revenue collection for Oregon's roads and highways that will replace the current system for revenue collection."[3]

The driving motivation behind this effort is concern over the steadily eroding purchasing power of the fuels tax, a phenomenon resulting from: a) the fact that the fuels tax is not indexed for inflation; b) continued increases in the fuel efficiency of new vehicles, especially hybrids and alternative-fuel vehicles; and c) a persistent reluctance on the part of voters to accept periodic increases in the tax rate. Given these issues, the Legislature asked the Task Force to evaluate the potential of alternate strategies to replace the fuels tax, focusing in particular on technical strategies for implementing a mileage-based charge.

Under the terms of an ODOT grant from the Federal Highway Administration's Value Pricing Pilot Program, the Task Force is also investigating the possibility of using the same technology base to apply congestion tolls. In spring 2006, the Oregon Department of Transportation is planning to test the mileage-based fee and congestion pricing in a Pilot Program.

1.1.2 Mission Statement

Under the broader mandate, the specific mission of the Road User Fee Task Force as refined and ultimately adopted by the Task Force became:

> To develop a revenue-collection design funded through user pay methods, acceptable and visible to the public, that ensures a flow of revenue sufficient to annually maintain, preserve and improve Oregon's state, county and city highway and road system.[4]

The Task Force recognized that its mission should not include making recommendations on the level of funding for the road system but rather address the replacement of current revenue mechanisms, such as the fuels tax, that will be less effective revenue sources in the future. (See Appendix A for background on the genesis of the Road User Fee Task Force and membership list.)

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[1] HB 3946 (2001)
[2] The Road User Fee Pilot Program has received three grants from the Federal Highway Administration's Value Pricing Plot program totaling $2.164 million over six years. The obligated state contribution totals $771,729.
[3] Section 2 (2), chapter 862, Oregon Laws 2001
[4] Road User Fee Task Force Minutes, March 8, 2002

CHAPTER 2
COMPONENTS OF OREGON'S ROAD FINANCE PROBLEM

2.1 KEY FEATURES AND MILESTONES FROM OREGON'S ROAD FINANCE HISTORY

In order to provide some context for understanding and responding to this road use/gasoline tax gap, the following provides an overview of nearly 90 years of Oregon road financing policy, taxing strategies and state decision-making. This material was provided in the March 2003 Report, but since it remains critically relevant to an explanation of the transportation infrastructure finance crisis (as will be evident in many of the graphs that follow), it is re-presented here for the convenience of readers. It is worthwhile to note that Oregon was a leader in road finance innovation during our nation's first years of road-building enterprise. The mileage fee program recommended by ODOT and the Road User Fee Task Force offers an opportunity for reasserting that quality of innovation into the 21st century.

1917 to 1982: Fuels taxes Finance Construction of Oregon's Highway System

Oregon enacted the nation's first fuels tax on gasoline in 1919. Build-out of the first Oregon Highway Plan provided the motivation for this new tax and several early rate increases.

1970 to 1981: Rampant Inflation Disrupts Road Purchasing Capability

Rampant inflation during the 1970s and early 1980s had a deleterious effect on road revenues. By 1981, increasing road costs had seriously eroded the buying power of fuels tax revenues. At great risk was Oregon's ability to maintain its roads and add capacity for increasing numbers of Oregonians who were driving more miles every year. Notwithstanding the deepening crisis, voters rejected fuels tax increases in 1976, 1978, 1980 and 1982.

1980s: Fuel Efficiency Reduces Gasoline Purchases and Fuels tax Revenues

While inflationary pressures continued to erode the purchasing power of the fuels tax throughout the 1980s, a new problem emerged that had an equally negative impact on available fuel-tax dollars. Owing to dramatic increases in gasoline prices, motorists sought and purchased more fuel-efficient motor vehicles. The improved statewide fleet fuel efficiency caused a proportionate reduction in gasoline purchases and, correspondingly, fuels tax revenues.

1983 to 1991: Legislature Responds to Road Revenue Crisis

Notwithstanding voter rejection of ballot measures for fuels tax increases, the Legislative Assembly sought to resolve the crisis by enacting fuels tax increases every session from 1981 through 1991. By 1993, the state fuels tax on gasoline was 24 cents per gallon.

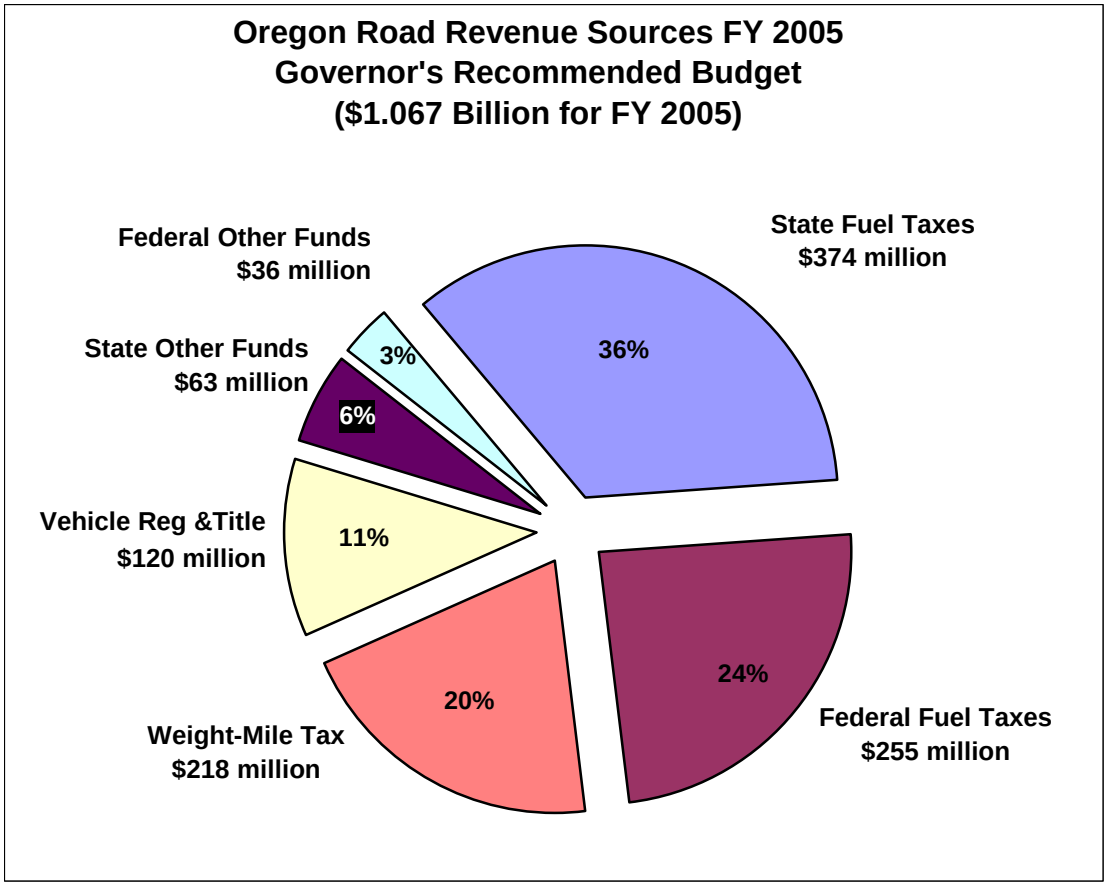
Post 1993: Fuels tax Rate Stalls

The new road dollars flowing from gasoline tax rate increases enacted prior to 1993 allowed a limited road modernization program in the early 1990s. By the late 1990s, however, inflation, increasing statewide fleet fuel efficiency, and a stagnant fuels tax rate eroded road revenues enough for the governor to mandate a maintenance-only policy. In 1999 the voters rejected a fuels tax increase. By 2005, the fuels tax had not increased in almost 12 years.

2.2 OREGON'S DEPENDENCE ON GASOLINE TAX FOR ROAD FINANCE

The revenue from the state fuels tax on gasoline continues to constitute the bulk of the total statewide funding available specifically for the purpose of maintaining and improving Oregon roadway infrastructure. According to the Governor's Recommended Budget, in 2005, fully 80 percent of Oregon's road revenues depend on state fuels tax collections, both directly and indirectly. (See Figure 2A.) This relationship is direct, in the form of state and federal gasoline taxes on purchased fuel, accounting for 60 percent of total Oregon road revenue, and indirect, with an additional 20 percent coming from Oregon's weight-distance tax rate for heavy trucks, which itself varies according to the level of state fuels tax and other vehicle-related revenues.[5]

Figure 2A: Oregon Highway Fund Revenue Sources FY 2005



Source: 2005-2007 State of Oregon Governor's Recommended Budget

Figure 2A, Oregon Highway Fund Revenue Sources FY 2005, illustrates this dependence on fuels taxes, as it breaks out the components in the Governor's recommended FY 2005-2007 road transportation budget.

[5] Under the Oregon Constitution, the level of weight-mile tax for heavy vehicles (trucks) is directly linked to revenues generated from passenger vehicles, such as fuels taxes, registration and title fees. For example, if fuels tax revenues drop, the Oregon Legislature would be obligated either to proportionately reduce weight-mile taxes, or, alternatively, to increase state fuels taxes in order to maintain the same level of revenue from trucks using Oregon's roads.

2.3 OREGON GASOLINE TAX REVENUES LAG ROAD USAGE AND KEY GROWTH INDICATORS

2.3.1 Statewide Trends in Population, Income and Vehicle Miles Traveled (VMT)

This section presents Oregon historical demographic, economic, vehicle miles traveled (VMT) and gasoline tax revenue data for the 33 years from 1970 to 2003. Table 2A summarizes these key
indicators and clearly highlights the disjunction between population, economic growth and road usage on the one hand, and gasoline tax revenues on the other. Oregon's population increased 69 percent between 1970 and 2003, while per capita personal income (adjusted for inflation) increased 54 percent. Given Oregon's historic land use and development patterns, residential possibilities and preferences and the location of employment opportunities, growth in population and economic activity reflect similar increases in per-person VMT. When per capita VMT increases are magnified by absolute increases in population, the result is an increase in aggregate VMT (171 percent) that is significantly higher than population increases alone (69 percent). The increases decline, however, when comparing aggregate statewide gasoline tax revenue: in 2003 the state revenues from that source were only 36 percent of the 1970 revenues, in real (inflation-adjusted) figures.

Worse—and particularly relevant for this report and the objectives of the mileage fee—by 2003, the gasoline tax revenue in "cents per vehicle mile traveled" (after subtracting inflation) *declined by half* since 1970. The gasoline tax has quite obviously, and potentially catastrophically, become de-linked from road usage at both the absolute statewide level and in relation to actual individual use of the roads. The gasoline tax is failing the purpose for which it was originally intended—funding the efficient operation and maintenance of Oregon's road system.

Table 2A: Oregon Demographic, Income, VMT and Gas Tax Data

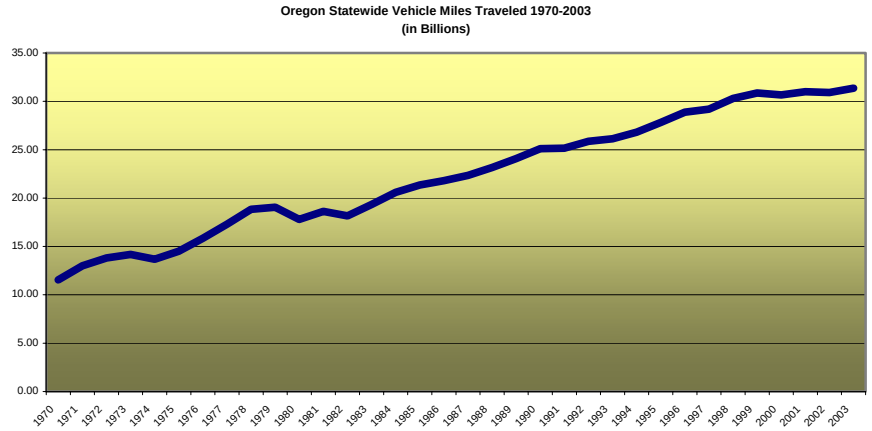
Oregon Statewide Data	Population	Real Per Capita Personal Income ($2003)[6]	Statewide Vehicle Miles Traveled (Billions)	VMT Per Capita (miles)	Total Gasoline Tax Revenue (Millions $2002)[7]	Gasoline Tax Revenue in Cents per VMT ($2002)[8]
1970 Data	2,091,533	$18,606	11.55 B	5,524	$266.33	2.31 cents
2003 Data	3,541,500	$28,734	31.36 B	8,855	$362.69	1.16 cents
Percent Change 1970 to 2003	69%	54%	171%	60%	36%	(50%)

Source: Oregon Department of Transportation Office of Innovative Partnerships and Alternative Funding (May 2005)
See Appendix B of this report for detailed data tables and sources.

[6] Real inflation-adjusted constant 2003 dollars, US Bureau of Economic Analysis.
[7] Gasoline tax revenue is expressed in terms of constant 2002 dollars, thus removing inflation and highlighting the "real purchasing power" of the revenue generated by the gasoline tax over the 33 years from 1970 to 2003.
[8] Like total revenue, gas tax revenue as "cents per mile" is expressed in terms of "real," i.e, constant, 2002 dollars.

Figure 2B shows that the statewide aggregate increase in VMT between 1970 and 2003 rose from 11.55 billion miles to 31.36 billion miles. This near tripling of VMT adds additional burden to the highway system while the real value of the fuels tax has not kept pace.

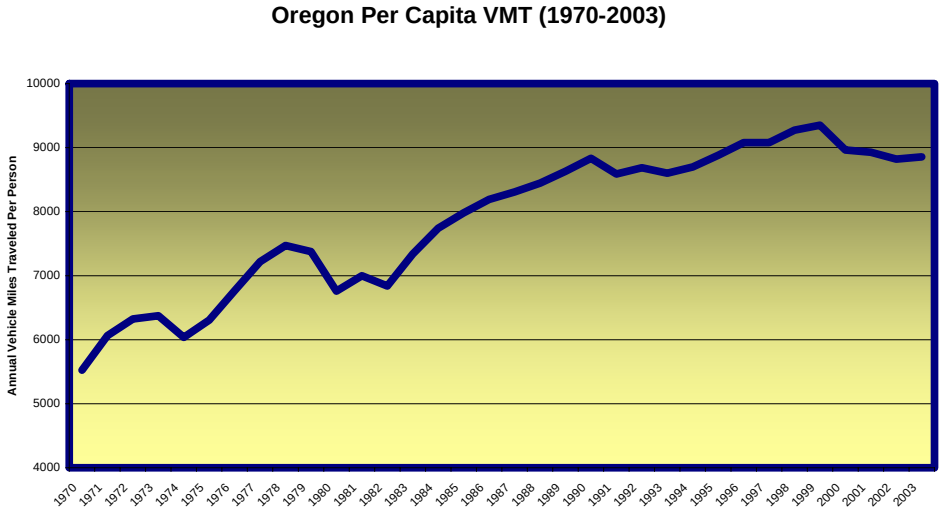
Figure 2B: Oregon Statewide Light* Vehicle Miles Traveled (1970-2003)



Source: Oregon Department of Transportation Financial Services (2003)
**VMT figures include all vehicles weighing 8,000 lbs or less*

Figure 2C shows numerous peaks and valleys along a path that describes an overall upward trend in per capita VMT since 1970. This growth in annual vehicle miles traveled by individuals rose by 60 percent, from 5,524 miles in 1970 to 8,855 miles in 2003.

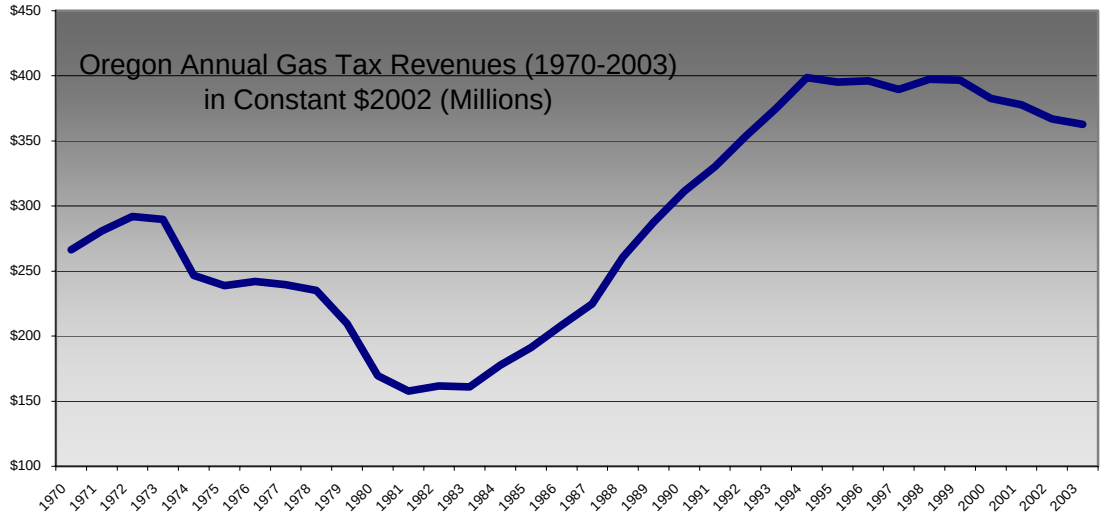
Figure 2C: Oregon Per Capita Light Vehicle VMT (1970-2003)



Source: Oregon Department of Transportation Office of Innovative Partnerships and Alternative Funding (May 2005)
Population data from Portland State University Population Research Center. Annual VMT data from ODOT.

Figure 2D shows a 36 percent increase in Oregon's inflation-adjusted annual gasoline tax revenue over the period 1970 to 2003. Like fluctuations in per capita VMT, total real gas tax revenues dip during the 1973-74 energy crisis, the early 1980s recession, and the current economic slowdown precipitated by the bursting of the tech bubble in 2000.

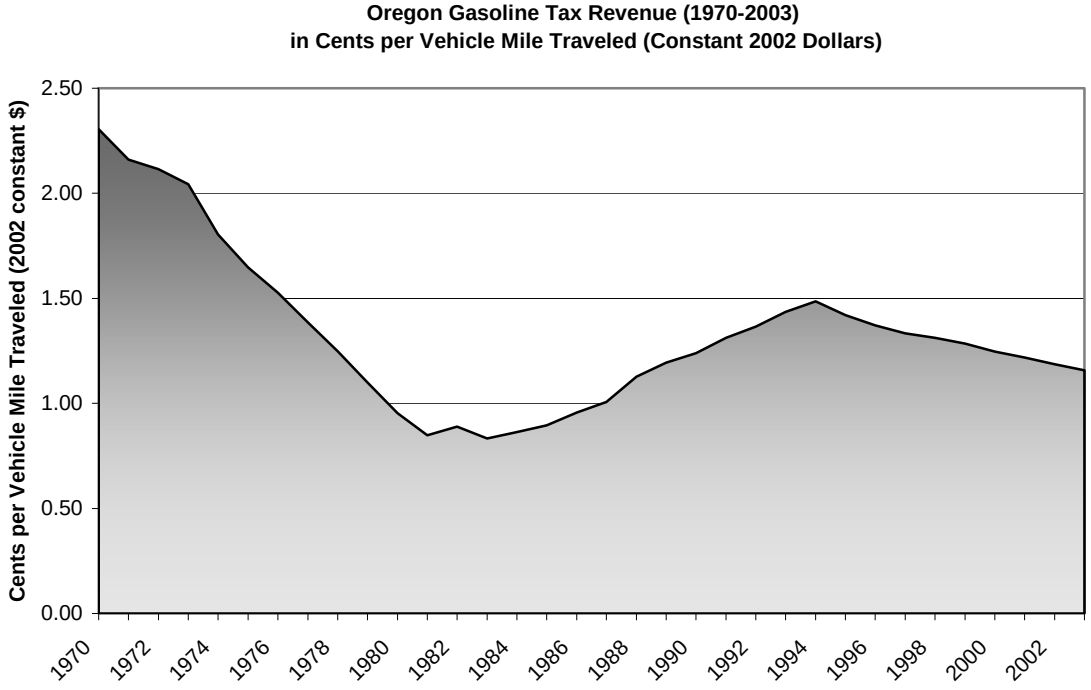
Figure 2D: Oregon Statewide Real Annual Gas Tax Revenues (1970-2003)



Source: Oregon Department of Transportation Financial Services (2003)

Figure 2E shows Oregon gasoline tax revenues, expressed in terms of cents per vehicle mile traveled for the years 1970 to 2003. Because the graph uses constant 2002 dollars, general inflation over the period has been factored out, thus isolating and revealing changes that are specific to factors internalized within the gasoline tax/VMT calculation itself. The infrastructure requirements needed to address problems due both to statewide and per person increases in VMT are met with relatively less *and* steadily decreasing gasoline tax revenue per mile driven.

Figure 2E: Oregon Gasoline Tax Revenues in Cents per VMT

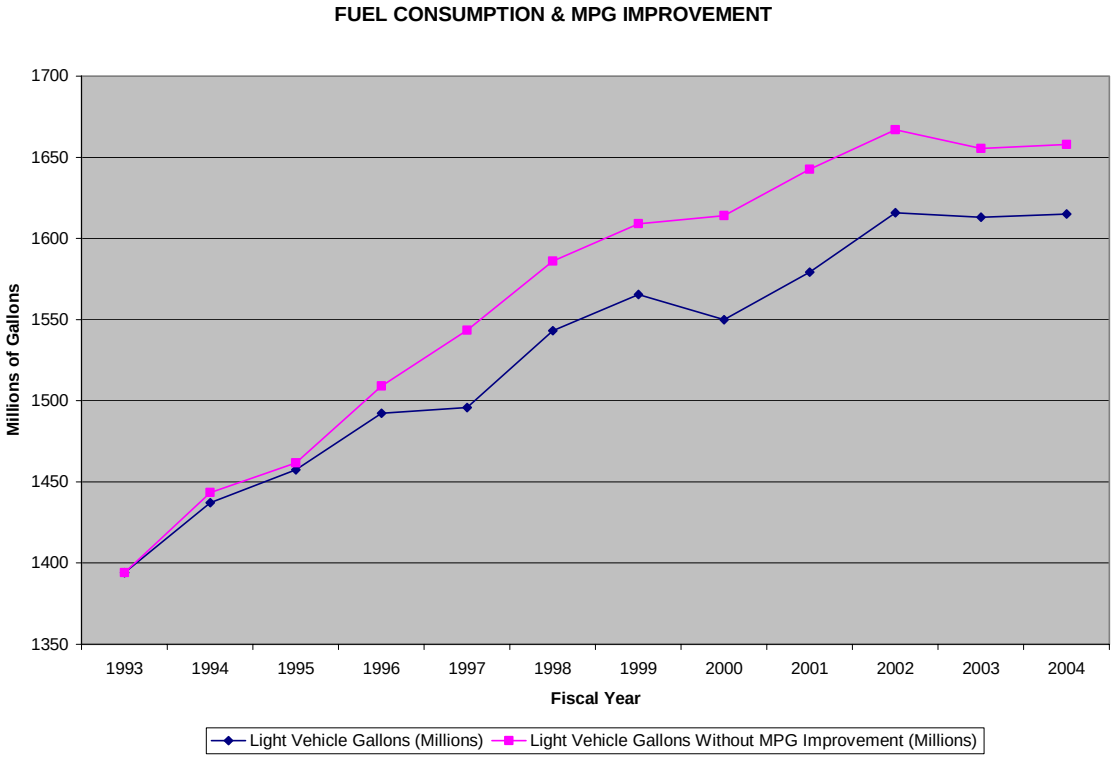


Source: Oregon Department of Transportation Office of Innovative Partnerships and Alternative Funding (May 2005)
Annual Gasoline Tax Revenues and VMT data from ODOT.

2.3.2 Rate of Increase in Gasoline Consumption Slows

Since the last state fuels tax increase in 1993, overall Oregon gasoline consumption has tended to increase, generally attributable to a combination of factors, including increased economic activity, population growth and a rise in the per capita and aggregate number of vehicle miles traveled per year. Since 1998, however, the economic downturn and modest but steady increases in average vehicle fuel efficiency have slowed the rate of increase in fuel consumption. Since 2002, gasoline consumption has shown a slight decrease and then remained flat. As Figure 2F indicates, annual statewide fuel consumption, and associated gasoline tax revenues, would now be approximately 50 million gallons greater by now, had vehicle fuel efficiency not improved since 1993.

Figure 2F: Fuel Consumption, With and Without MPG Gains (1993-2004)



Source: Oregon Department of Transportation Financial Services (April 2005)

2.3.3 Low Public Support for Gasoline Tax Increases

Oregon voters have not approved recent ballot measures proposing to increase the gasoline tax, and thus the tax remains frozen at the level of its last legislative increase, in 1993, which is 24 cents per gallon.

2.3.4 Gasoline Tax is not Indexed for Inflation

The general rate of inflation is about 2 to 3 percent per year in the economy overall. However, for some sectors the escalation in costs can be much higher. Inflation in the costs for road maintenance and, especially, the components of capital projects such as right-of-way acquisition and structures (bridges, overpasses, etc.) has increased much faster than general inflation for the past seven years largely as a result of both commodity cycles and the overall business cycle. This is expected to continue for the next several years before abating to levels closer to general inflationary patterns

2.4 THE FUTURE OF OREGON ROAD FINANCING: INCREASING EROSION OF GASOLINE TAX PURCHASING POWER

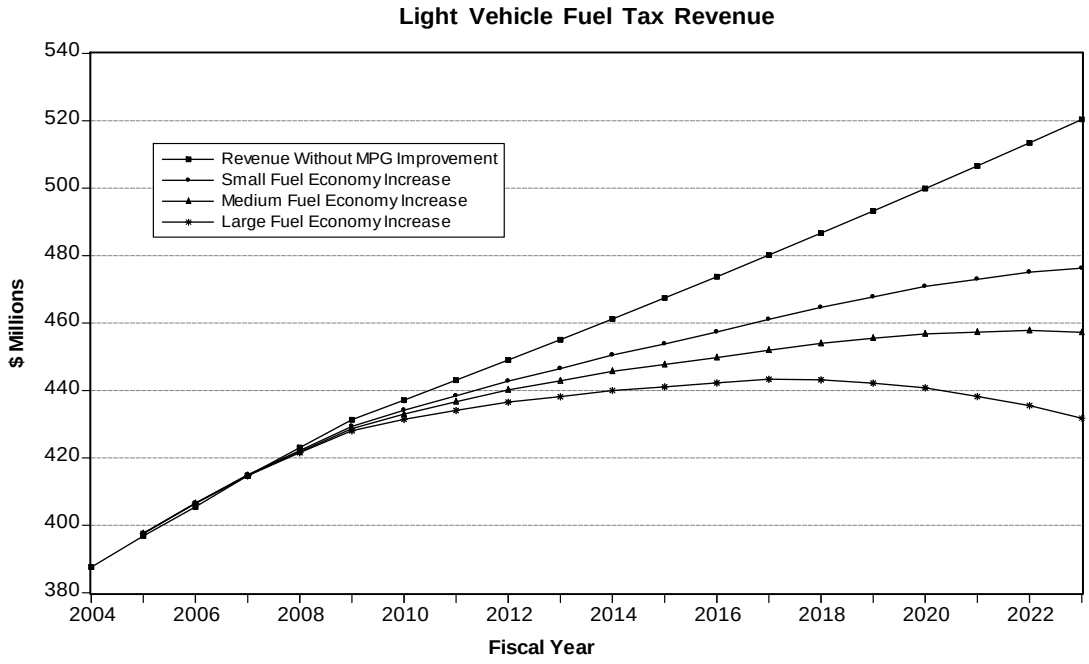
2.4.1 Projected Gains in Fuel Efficiency Translate into Declining Gasoline Tax Revenues

As a result of fuel efficiency improvements in conventional vehicles, combined with the market penetration of alternative (non-gasoline) powered vehicles (both trends are hastened by increases in gasoline prices at the pump), Oregon fuels tax revenues from the sale of gasoline are likely to level off and then permanently decline 12 to 18 years from now. The extent and timing of the

decline varies with assumptions about the extent and timing of alternative vehicle market penetration, but the likelihood of the decline, absent a change to Oregon's road financing mechanism, is not in dispute.

Furthermore, because fuels tax payments from light vehicles (passenger vehicles) affect tax rates for heavy vehicles (large trucks) under the Oregon Constitution, the state would experience reduced revenue from heavy vehicles as well. The entry of highly fuel-efficient passenger vehicles into the marketplace reflects increased consumer interest and demand. This market is projected to become significant in five to eight years, according to many industry experts. Hybrid electric and clean diesel passenger vehicles may lead this trend, say authors of a 2004 US Department of Energy study[9]. Figure 2G shows the effect that a gradually increasing market for hybrid electric gasoline and clean diesel vehicles could have on Highway Fund revenue, in combination with some other fuel economy improvements. After eight to 12 years, the negative revenue impacts become large in dollar terms and are likely to grow at a very rapid rate. Under any of the increased mileage efficiency scenarios, revenue reductions of significant magnitude will result in a severe crippling of ODOT's ability to operate, maintain and improve Oregon roads.

Figure 2G: Potential Impacts of Fuel Efficiency Increases & Alternative Fuel Vehicles on Oregon Gasoline Tax Revenue (2004-2023)



Source: Oregon Department of Transportation Financial Services (April 2005)
See Appendix C for detailed data, assumptions and methodology used.

[9] Greene, Duleep & McManus, *Future Potential of Hybrid and Diesel Powertrains in the U.S. Light-Duty Vehicle Market*, August 2004 (ORNL/TM-2004/181). Obtained electronically in May 2005 from Oak Ridge National Laboratory website at http://cta.ornl.gov/cta/Publications_Index.shtml

2.4.2 A Combination of Factors will Further Imperil Oregon's Fuels tax Revenues

As the previous section showed, in the period from 1993 through 2004, the combination of the increased fuel efficiency of the statewide passenger vehicle fleet and increased road costs had the effect of a one-two punch on the purchasing power of the Oregon road dollar to meet ever-increasing demands made on the road system. These two factors directly contribute to diminishment of the fuels tax's potential to raise adequate revenue to maintain and improve Oregon's roads and highways.

2.4.3 Projected Gasoline Price Increases will Increase Demand for Technology Improvements

Peak Oil

Some petroleum industry experts predict that before 2010 the world production of conventional oil will crest and enter a permanent decline while others estimate the midpoint will be reached as late as 2030 if oil consumption growth levels increase at a 2 percent rate.[10] Furthermore, the recent and projected increases in global demand for oil products—owing to growing economies in China, India and other emerging national economies—may well cause the peak to arrive earlier than anticipated. Whichever estimate of the "peak" is correct, it is now clear that oil supplies will become constricted in the not too distant future.[11] After the peak, gasoline prices would increase significantly while alternatively powered vehicles and fuel efficiency measures are developed and employed at a greater rate of acceptance.

Global Oil Production and Price Volatility

As the oil reserves of western democracies decline, their economies are becoming ever more reliant on the oil production capacity of nations with potentially volatile political climates. The world's nations with the largest remaining oil reserves—Saudi Arabia, Iran, Iraq, Kuwait, The United Arab Emirates, Venezuela, Russia, Libya, Nigeria—all have great potential for political volatility. Disruptive politics leads to disruptions in oil production that result in oil price hikes. While western nations will work to calm the political volatility in these nations, the potential for large price swings owing to political events are likely not to be stilled in the near term. Large price swings in the world supply of oil will significantly increase the demand for vehicles with greater fuel efficiency in the coming decades.

2.4.4 Greater Fuel Efficiency in the Conventional Passenger Vehicle Fleet

There are now in play a number of interrelated dynamics that will likely support a renewed interest in fuel efficiency on the part of automakers, policy-makers and consumers. This section briefly describes the key factors.

[10] The experts do agree with the estimate that United States is over 30 years past the midpoint of crude-oil production capacity. This means that the United States is now well into consuming the second half of its ultimate recovery of oil, which includes the combination of oil extracted to date, known reserves and projected discovery of oil.

[11] See *The End of Oil: On the Edge of a Perilous New World,* by Paul Roberts, 2004; *Beyond Oil: The View from Hubbert's Peak,* by Kenneth S. Deffeyes, 2005; *Oil: Anatomy of an Industry,* by Matthew Yeomans, 2004.

Composite Materials Reduce Vehicle Weight
In addition to innovation in engines, new composite materials are under development that will make vehicles stronger but weigh much less. An overall reduction in vehicle weight will increase the miles per gallon ratio and decrease gasoline consumption accordingly.

Likely Oregon Motorist Reaction to Gasoline Price Swings
The rising price of crude oil is likely to spur dramatic market demand for improvements in fuel economy for conventional passenger vehicles over the next 15 years. This will have a direct impact on Oregon's light vehicle fleet as new vehicles gradually replace less fuel-efficient vehicles.

In response to short-term upsurges in gasoline prices at the local pump, drivers in households with multiple vehicles are likely to increase their use of the most fuel-efficient vehicle. Some Oregonians may also choose to switch modes, either carpooling more often, or taking transit where that mode is available, convenient and attractively priced. In the longer term, Oregonians can be expected to make fuel efficiency a higher priority in their choice of vehicle purchase. Location decisions that reduce commute miles, although more difficult for most multi-worker households, could also occur as transportation fuel costs weigh on household budgets.

These factors will tend to reduce Oregon's available gasoline tax revenues for use in roadway maintenance and improvement.

2.5 ALTERNATIVE FUELS AND VEHICLES IN VARYING STAGES OF MARKET-READINESS

Not many years ago, the "future of alternative fuels" seemed permanently fixed in the future. Now, the broad range of advanced fuels and vehicles powered by non-gasoline sources is no longer exotic and distant—some are already on the roads, and many others are attainable within a five to ten year time horizon.

2.5.1 Increasing Market Penetration by Alternative Technologies

Hybrid Electric Vehicles (HEVs) Take Hold
Every major automobile manufacturer either has models with the hybrid electric vehicle option (HEV) on the market now (mid-2005) or plans to introduce them soon. HEVs are powered by both a gasoline-fueled engine and an electric engine, automatically applying power from each at the appropriate time. HEVs generate and store electricity generated during driving activities that ordinarily cause a loss of energy, such as braking. HEVs do not require an external source of electric power; they do not need to be plugged in. Currently, HEVs have the ability to obtain 35 to 70 miles per gallon, depending upon the hybrid technology employed, vehicle weight and usage characteristics. The automobile manufacturers that entered the HEV market earliest are now planning HEV options for a full range of models. Those that entered the market later are planning to introduce several models with the hybrid electric engine option during the next few years.

The past few years have yielded dramatic changes in market opportunities for the hybrid electric passenger vehicle. Several years ago, only the Honda Insight, an extremely light-weight two-passenger vehicle, was available for purchase in the United States. By 2005, Toyota and Honda moved well beyond their early market entries (Prius and Honda Civic Hybrid, respectively) to

include larger standard vehicles with hybrid options (Lexus SUV, Highlander SUV, Camry and Accord) all due in the marketplace during 2005. Also, in September 2004, the U.S. automakers entered the field for the first time with the Ford Escape SUV Hybrid. According to J. D. Powers and Associates, 35 passenger vehicle models with hybrid electric options will be entering the marketplace by 2008. All major automobile manufacturers are developing hybrid electric options for passenger vehicles, many of them for large trucks, SUVs and sports cars. According to industry reports, many of the new models will be marketed for added horsepower rather than fuel efficiency improvements. The day of the ubiquitous hybrid electric passenger vehicle is soon to come.

Fuel Cell Vehicles

All major automakers are developing vehicle engines powered by hydrogen fuel cells. Fuel cell technology generates electricity and heat through a chemical reaction, other than combustion, mixing hydrogen with oxygen. As a fuel source, hydrogen is twice as efficient as gasoline thus allowing twice the miles traveled per gallon. Over the next few years, the major automakers will be fleet testing fuel cell prototype vehicles across the world in a myriad of environments.

When perfected, fuel cell vehicles may enable introduction of a hydrogen economy independent of oil production. The automaker Toyota has indicated that fuel-cell vehicles will likely use hybrid electric technology to boost hydrogen fuel efficiency like it does for gasoline powered vehicles. There are numerous technological hurdles that must be cleared before these vehicles are ready for mass production, including the notable "chicken and egg" problem: Automakers don't want to produce vehicles for which consumers can't easily purchase fuel; hydrogen suppliers don't want to build infrastructure for a non-existent or marginal market. Currently, there are only about two dozen such stations in the United States. Despite numerous difficulties that must be overcome (e.g. energy efficient creation of hydrogen fuel, vehicular fuel storage and fuel distribution network) before fuel cell vehicles become marketable, a common view is emerging that the commercialization of fuel cell vehicles will begin in the early part of the next decade with some automakers believing substantial production could occur as early as 2010. To that end, many states, including California and Florida, are moving deliberately toward implementation of the first wave of hydrogen fueling networks.

Low-Sulfur Clean Diesel

Although clean diesel passenger cars have not yet caught on in the US, where diesel is more commonly used in heavy duty on- and off-road trucks and equipment, advances in the European market are likely to be imported to the US, when the cleaner low-sulfur diesel is made more widely available. As with other alternatives to gasoline, the real potential for market penetration of this alternative will depend on a number of factors, including vehicle price differentials and the price of fuel relative to gasoline.

Natural Gas

Despite the fact that natural gas is, itself, a limited fossil fuel resource, some believe that natural gas powered vehicles will provide a bridge to future technologies, possibly based on fully renewable fuels.

- **Compressed Natural Gas (CNG)**[12]
  Compressed natural gas vehicle models are currently on the market, either as dedicated or dual-fuel vehicles. There are over 1,300 refueling stations in 46 states, according to US Environmental Protection Agency records. Home refueling can be accomplished with a small compressor, taking advantage of existing home natural gas supply. CNG passenger vehicles cost between $3,500 and $6,000 more than gasoline equivalents, though that cost differential is expected to diminish.

- **Liquefied Natural Gas (LNG)**[13]
  Liquefied natural gas has not been the focus of light duty applications; instead it is used for heavy duty fleets such as transit buses and trash trucks.

- **Propane**
  Propane, a byproduct of natural gas and petroleum refining, has been the fuel of choice in an extensive propane fleet used successfully by the Texas Department of Transportation. Notwithstanding, recent or pending withdrawal of vehicle manufacturers from that market may threaten that program, and certainly does not augur well for expansion of propane vehicle use in the future.[14]

Methanol[15]

Also known as "wood alcohol," most methanol is now made from natural gas, though it can be derived from renewable biomass sources. Most methanol vehicles use M85, an 85 percent blend with 15 percent unleaded gasoline. As of 2002, approximately 15,000 M85 dual-fuel vehicles were in use, mainly in California. These vehicles can switch to 100 percent gasoline when methanol is unavailable (and methanol is not widely distributed.). Some experts believe the best application of methanol is to create a fuel supply for fuel cell vehicles.

Biofuels

Biofuels refers to fuel components derived from biomass including virgin plants or crops, straw, and plant waste.

- **Ethanol**[16]
  In the US, where 90 percent of ethanol is made from corn, the competition with agricultural needs, as well as the energy, water and chemical inputs required to grow corn and produce the ethanol, have led to serious criticism of this alternative on a "well-to-wheels" lifecycle basis. More promising is the development of new technologies that convert cellulose from plant residue, rather than food or livestock crops, into ethanol. This fuel is available in the US in a blend of 85 percent ethanol and 15 percent gasoline (E85). Ethanol advocates want to see it used in the "reformation" process to create hydrogen for hydrogen fuel cells or hydrogen internal combustion engines and point out that it is a better hydrogen feedstock than gasoline.

[12] US EPA Compressed Natural Gas Fact Sheet: http://www.epa.gov/otaq/consumer/fuels/altfuels/420f00033.pdf
[13] US EPA Liquified Natural Gas Fact Sheet: http://www.epa.gov/otaq/consumer/fuels/altfuels/420f00038.pdf
[14] US EPA Propane Fact Sheet: http://www.epa.gov/otaq/consumer/fuels/altfuels/420f00039.pdf
[15] US EPA Methanol Fact Sheet: http://www.epa.gov/otaq/consumer/fuels/altfuels/420f00040.pdf
[16] US EPA Ethanol Fact Sheet: http://www.epa.gov/otaq/consumer/fuels/altfuels/420f00035.pdf

- **Biodiesel**[17]
  Biodiesel can be produced from virgin oils, or from agricultural feedstocks, animal fat or vegetable grease, and can be used in any conventional diesel engine with little or no change in performance. Biodiesel is most often made from soybeans in the US, and is used in its pure form (B100, or "neat biodiesel") or in a blend with petrodiesel, typically B20, or 20 percent biodiesel and 80 percent petrodiesel (diesel derived from petroleum). Biodiesel is growing in popularity, especially in states with a strong agricultural sector.

- **Biomass**
  As mentioned in connection with ethanol, methanol and biodiesel, the use of plant waste from agricultural processes promises a more economical, socially responsible and environmentally sound means of producing many biofuels. Advances in this area will increase the benefit profile of biofuels and likely speed up and broaden existing market penetration trends.

2.5.2 Paying Fair, Paying Smart: Mileage Fees vs. Oregon's Current Use Fuels tax for Alternative Fuel Vehicles

Far from being a distant technological mirage on the highway ahead, alternative fuels are here today, in transit fleets, at airports, and in the garages of a handful of early adopters. Meanwhile, researchers, policy-makers and commercial enterprises alike are placing serious bets on a range of contenders for the long-distance race. Thus, the historic and ongoing erosion of Oregon's gasoline tax revenue stream due to inflation and conventional vehicle fuel-efficiency could be compounded by the introduction of large numbers of non-gasoline fueled vehicles that are likely to appear in dealers' lots after the end of this decade.

Oregon has a Use Fuels tax statute in place[18], which charges alternative (i.e., non-gasoline) fuel purchases at the retail level (whether or not at a retail establishment) based on the energy contained in the fuel. The statute was adopted before the most recent advances in the alternative fuel and vehicle sector. In addition, many of the complications of administering, auditing and enforcing the law were not fully foreseen or addressed. For example, the fee may be difficult to administer, audit and enforce for those motorists refueling from home or other decentralized locations. Further, like the gasoline tax, the Use Fuels tax is not indexed for inflation. Like those paying the gasoline tax, drivers of alternative fueled vehicles could well end up paying differing amounts in tax for the same number of miles of road use due to differences in fuel economy among vehicles using the same alternative fuel. The mileage fee, which is proposed for all new vehicles sold in Oregon once instituted, would bring alternative fuel vehicles under its umbrella, establish a fair and uniform market-based fee based on actual mileage (use of the roads) and thus the more complicated Use Fuels tax would be rendered superfluous.

2.5.3 Road Revenues vs. Social Goals Associated with Alternative Fuels

Over the years, many mainline environmental organizations have come to a position of support for pricing strategies, whether structured as mileage fees, congestion or value pricing, zone, cordon or area fees, emission fees, pay-at-the-pump vehicle insurance or a combination thereof, because they recognize that by converting some of the high fixed costs of auto ownership and operation to variable costs, motorists are encouraged by the logic of their pocketbook to make more thoughtful decisions regarding personal mobility. Nevertheless, some people continue to

[17] US EPA Biodiesel Fact Sheet: http://www.epa.gov/otaq/consumer/fuels/altfuels/420f00032.pdf
[18] ORS 319.510 et seq.

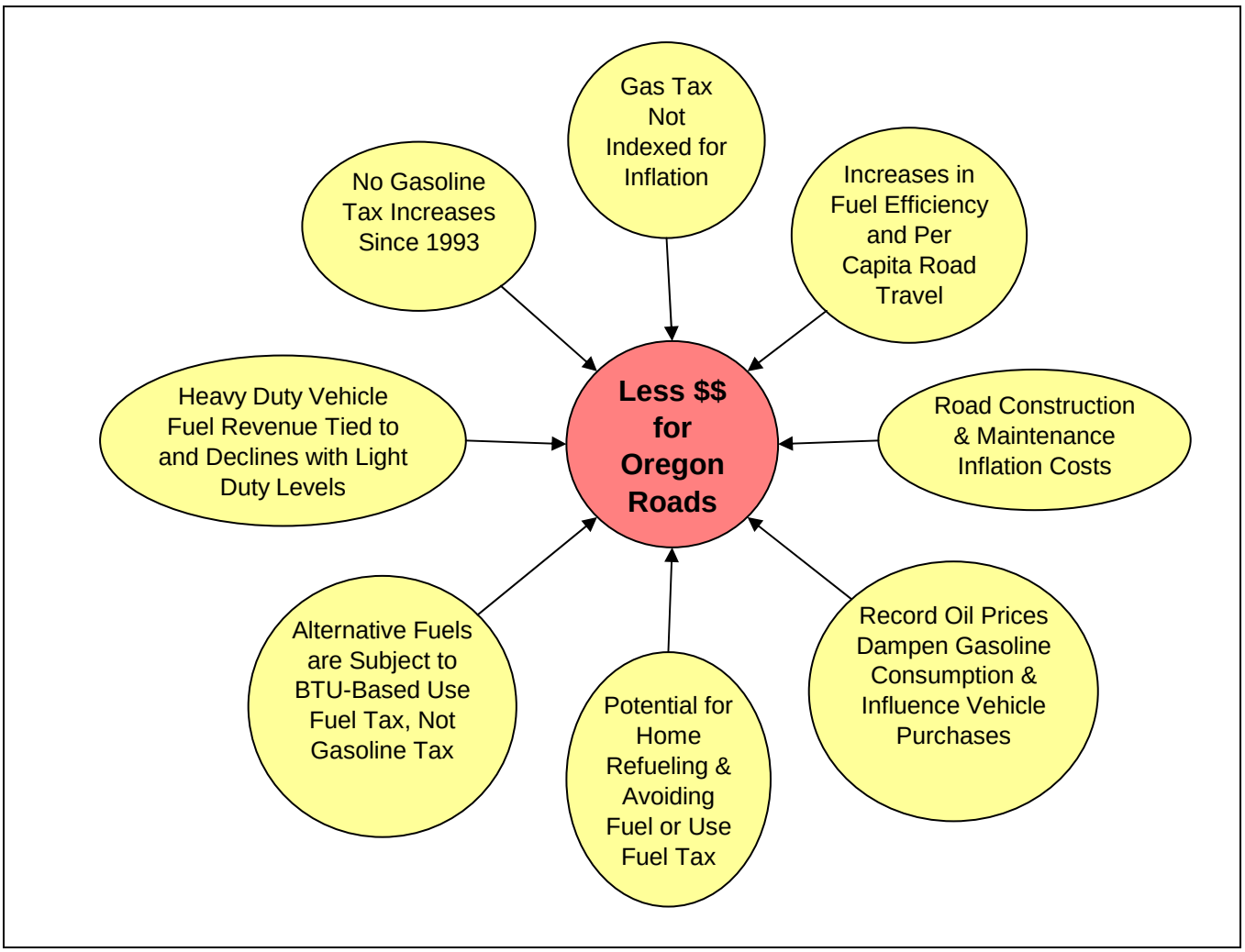
be concerned that charging owners of alternative fuel vehicles for use of the roads will dampen consumer enthusiasm for needed innovative vehicle technology. However, alternative fuel vehicles need little in the way of special treatment to appeal to early adopters.

In addition, a strong equity argument can be made that each vehicle, no matter what fuel it uses, imposes costs on the road system because it occupies scarce and increasingly costly roadway space. This is especially true at peak hours in congested corridors, which is the rationale for imposing fees based not only on mileage, but on the level of congestion as well. A case for an across the board mileage fee can be made from an equity standpoint, in that it tends toward more even treatment of similarly situated motorists making similar demands on Oregon's roads. Environmental issues might better be addressed through an environmentally-targeted taxing structure which rewards people for choosing environmentally sound fuels and technologies.

2.6 SUMMARY: WHAT'S EATING THE GASOLINE TAX?

As this chapter has illustrated, there are a large number of factors, many of them interrelated, which will continue to depress the *aggregate revenue* Oregon receives from the gasoline tax, as well as diminish *revenue per mile*. In addition, motorists making similar use of the roadways (i.e., accruing the same or nearly the same annual in-state mileage) can end up contributing different amounts to Oregon's Highway Fund for road maintenance and capital improvements. As explained, this occurs both because of differential fuel economy characteristics associated with a wide variety of conventional gasoline vehicle makes and models (within a single model year and over time), and because of the further complication introduced by the Oregon Use Fuel calculation assessing road user fees based on energy equivalents of alternative fuels. Further, the purchasing power of this diminished revenue stream is itself diminished, in terms of its ability to deliver Oregonians with needed transportation operations, maintenance and new construction of highway projects of wide social and economic benefit. Figure 2H illustrates the key factors contributing to this trend, as presented throughout Chapter 2.

Figure 2H: What's Eating Oregon's Gasoline Tax?



Source: Oregon Department of Transportation Office of Innovative Partnerships and Alternative Funding (May 2005)

CHAPTER 3
DEFINING AND REFINING OREGON'S MILEAGE FEE CONCEPT

3.1 INTRODUCTION

3.1.1 Chapter Content and Purpose

Section 3.2 describes the Oregon mileage fee concept, as refined by the Road User Fee Task Force in 2004, and how the concept's design features meet the policy guidelines established by the Task Force in 2003. Section 3.3 presents greater underlying detail on the system design policy choices for the concept and some alternative system design policy options that can be substituted for Task Force and ODOT recommendations. Outstanding issues are identified and discussed in Section 3.4. Section 3.5 provides a brief summary and segue to Chapter 4, which describes the development of the Pilot Program.

3.1.2 Background on Selection of a User Pay Replacement to Gas Tax

In a 2003 Legislative Report to the Oregon Legislature, the Road User Fee Task Force recommended that any new road revenue mechanism be based upon a "user pays" philosophy, that it generate sufficient revenue, and further, that it be transparent and acceptable to the motoring public, enforceable and capable of replacing the fuels tax on gasoline as the primary road revenue mechanism supporting the Oregon road system. The Task Force determined that new revenue sources known as "mileage fees" and "congestion pricing" (or "value pricing" or "peak period pricing") met these requirements, and recommended they be tested in a Pilot Program to be administered by the Oregon Department of Transportation. This Pilot Program, described in Chapter 4, will provide Oregon policymakers with information to determine whether implementation of a new mileage-based revenue collection system is practicable for funding Oregon's roads and bridges.

- **Mileage Fee**
  A distance-traveled charge imposed according to the amount a vehicle owner/operator uses the road system. The Task Force considers this per-mile charge to be the principal general revenue source for a new system that would ultimately replace the fuels tax.

- **Congestion Pricing (Value Pricing or Peak-Period Pricing)**
  Road use charges based on a vehicle's use of specific roadways that are higher during more congested time periods (peak commute times) and lower during the shoulders and off-peak periods for identified travel corridors. Assessment of the fees can be accomplished either through an independent electronic system using roadside readers or as a rate adjustment to a mileage fee for time of day travel in specific geographic areas where congestion prevails, known as "area pricing".

3.2 FROM CONCEPT TO DESIGN FRAMEWORK: SYSTEM RECOMMENDATIONS FOR INCORPORATING OREGON'S POLICY OBJECTIVES INTO A MILEAGE FEE STRATEGY

3.2.1 ODOT and Road User Fee Task Force Develop Policy Guidelines for Mileage Fee System

Since the 2003 Legislative Report on this subject, the Road User Fee Task Force and ODOT have collaborated to refine a set of policy-based design features for a new mileage fee system. These design features were developed in an iterative process of data collection, analysis, policy development and evaluation. They reflect input from industry and public sector experts as well as public sentiments and concerns obtained during an ongoing public involvement effort. The policy recommendations described in this section often address multiple issues simultaneously, or issues that are by nature multidisciplinary—affecting mobility, citizens' rights and fiscal responsibility in ways that must integrate theoretical and practical concerns sensibly in any ultimate system deployment.

ODOT contracted with consultants from Oregon State University and Portland State University to examine alternative policy and technology options supportive of a user-fee system. ODOT staff and the Task Force reviewed a number of reports and presentations, the most important of which are listed on the ODOT website at **http://www.oregon.gov/ODOT/HWY/OIPP/ruftf.shtml.** These technical reports and related ODOT policy analysis generated discussion, debate and consensus on a set of refinements to the Oregon mileage fee concept adopted by the Task Force in late 2004.

Under the Oregon mileage fee concept, upon statewide implementation of a mileage fee within the state, all passenger vehicles equipped with the necessary technology would pay a per-mile charge in lieu of the gasoline tax during a gradual phase-in period of up to two decades. Oregon's weight-distance tax would be retained for heavy trucks. As designed, the Oregon mileage fee concept could support imposition of congestion pricing fees (a.k.a. value pricing or peak period pricing) without additional technology infrastructure or alternative system design. As policy possibilities, however, the mileage fee and congestion pricing fees can be considered separately.

3.2.2 Public Input to Policy Guidelines

A major pathway for public input and for introduction of public concerns and preferences came from ongoing interaction of the Task Force members with their individual constituencies and the public as members discussed pertinent policy issues. The task force and ODOT also engaged in a public involvement effort, the results of which are described in the 2003 Legislative Report. (See Appendix G of the 2003 report.) ODOT continues to respond to all written and electronic correspondence submitted by the public on the development of the mileage fee concept and associated Pilot Program. The Task Force receives copies of all of ODOT's written and electronic correspondence with members of the public as well as media reports. Comments submitted by members of the public and media reports were substantial, many of which originated outside the borders of Oregon.

3.2.3 Linking Policy Decisions to Mileage System Features

Table 3A shows how the policy objectives established by the task force relate to, and are addressed by, the technical and institutional components of a design framework for the Oregon mileage fee concept. ODOT has developed the Pilot Program described in Chapter 4 to precisely test the critical elements of the Oregon mileage fee concept in real world circumstances.

Table 3A: How Mileage Fee System Features Support Policy Framework

How the Mileage Fee System Works (Key Technical, Operational and Administrative Features)	Related Elements of Oregon Policy Framework
HOW DOES THE NEW MILEAGE FEE SYSTEM ENSURE THAT EVERYONE PAYS FAIRLY FOR OREGON'S ROADS? WHAT ABOUT OUT-OF-STATE VEHICLES? **All Motorists Will Contribute to Oregon's Roads.** Upon statewide implementation of the mileage fee system, all vehicle miles traveled (VMT) within the state will be assessed a per-mile charge in lieu of the gas tax. A mileage fee will be collected from motorists operating new vehicles equipped with manufacturer-installed instruments that meet prescribed specifications. Motorists with older vehicles will continue to pay the fuels tax at the pump. Thus, in order to purchase fuel, all motorists (except heavy trucks) refueling within Oregon state borders, regardless of fuel choice, will pay either fuels tax or mileage fee. Tampering with on-vehicle mileage fee instrumentation in gasoline-powered vehicles will automatically trigger reversion to fuels tax system at next refueling, thus precluding evasion. Oregon's weight-distance tax would be retained for heavy trucks. **Proven Technology Ensures That Only In-State Miles Will Be Subject to Mileage Fee.** The VMT data would be collected electronically by zone (e.g. state) through combined odometer and global positioning system (GPS) technology. The odometer would count the miles driven and the GPS receiver would differentiate zones. As conceived, the zones would be polygons that represent state borders. (Note: Zones could be smaller to allow local option fees or for peak-period pricing on a local option basis, but such pricing strategies are separate from the mileage fee concept (see Section 3.4.2)).	☑ **Minimum Evasion Potential.** The method of payment for the mileage charge shall result in a rate of tax evasion no worse than for the fuels tax. ☑ **Differentiation of State Boundaries.** An Oregon mileage charge should be based on a rate applied only to miles driven in Oregon. Out-of-state miles driven by Oregon motorists should not be charged under Oregon's per-mile payment system.
HOW IS A VEHICLE'S MILEAGE DATA COLLECTED, USED AND STORED? HOW DOES THE SYSTEM BALANCE NEEDS FOR ACCURACY AND AUDITING, WITH PRIVACY CONCERNS? **No Tracking or Storage of Motorist Movements Required for System Compliance and Accuracy.** The on-vehicle device that records mileage never stores a vehicle's travel history; therefore, no vehicle location data are sent back to the satellite or anywhere else. The on-vehicle device's GPS receiver generates location data only for the purpose of identifying zones where mileage accumulates. Essentially, the sole purpose of the GPS receiver is to answer in a yes/no manner whether the vehicle is driving in a particular zone (e.g. the state of OR), for purposes of assigning	☑ **System Accurate and Reliable.** The new per-mile payment system should be as accurate and reliable as the current fuels tax.

How the Mileage Fee System Works (Key Technical, Operational and Administrative Features)	Related Elements of Oregon Policy Framework
miles driven to fee or non-fee categories. Data collection and fee payment would occur at fueling stations. VMT data and vehicle identification (to permit auditing and error detection) would be read from vehicles by readers at retail fueling stations via short-range radio frequency communications. The only data read by the RF reader would be the vehicle and device identification and the total number of miles driven in the differentiated zone categories (i.e., odometer readings that only get larger) for purposes of applying the per-mile fee. There would be no transmission of travel location points at any time to anyone. Only private sector entities would be involved with installing and maintaining the on-vehicle device, and operating the service station equipment for receiving the transmitted VMT data. The only operational component the Oregon government (i.e. ODOT) would have is a central computer system that would store the latest VMT data (odometer readings for zones) to compare against new VMT data read at retail fueling stations, identification numbers of vehicles and service stations, and records of transactions dates and the amount of fuel purchased. This information would be retained to allow adequate auditing by ODOT to ensure accurate fee assessment and lessen any potential for fee evasion. The only other direct involvement of ODOT in the mileage fee system is to receive fee revenues.	☑ **Protection of Privacy.** In recognition of strong public sentiment demanding that individual anonymity be assured for all mileage fee payers, system design should explicitly minimize both government and private institutional access to mileage data, fee application records and other identifying information or components.
HOW WILL MOTORISTS PAY THE NEW MILEAGE FEE? **No Behavior Change Required of Motorists.** VMT data transmitted from an equipped (new) vehicle would get passed to the point-of-sale system when a fueling transaction is started, at which time the mileage fees are applied to fuel purchase and gasoline or other fuels taxes are deducted. Motorists would experience no change in payment process. Existing fuels tax system will be maintained for non-equipped (older) vehicles, and will operate as it does today.	☑ **Ease of Use by Motorists. A** mileage-based revenue system will be more popular with the public, and thus politically acceptable, if behavior changes required of drivers to use the system are minimized.
WHAT WILL THE NEW MILEAGE FEE MEAN TO FUEL RETAILERS OR DISTRIBUTORS? **Negligible Change in Administrative Burden to Fuel Retailer.** Retail fueling stations would remit the mileage fee to ODOT through a paperless reporting system integrated with the current gas tax collection mechanism. There will be no more employee involvement in collecting the mileage fee than for the existing gas tax system, other than issuing one monthly check to ODOT to remit the mileage fees accrued above the gas tax paid.	☑ **Minimal Burden on Private Sector.** Technology should be applied to the mileage fee system in a manner to minimize the burden on private sector participants.

How the Mileage Fee System Works (Key Technical, Operational and Administrative Features)	Related Elements of Oregon Policy Framework
HOW WILL THE TRANSITION BE HANDLED? **Transition Will Not Result in Any Revenue Disruption.** A long phase in for the new mileage fee system will be necessary to ensure an orderly and low risk transition. Approximately five percent of the vehicle fleet turns over each year. Thus, the new system could take close to 20 years for full phase in. The fuels tax system will have to be retained and run concurrently with the mileage fee for non-equipped vehicles during the phase in period. **The State Fuels tax Would be Maintained for Non-equipped Vehicles and for System Redundancy.** No motorist would pay both the mileage fee and the fuels tax but each motorist would pay one or the other. If a motorist disables the in-vehicle VMT technology, the motorist would pay the gas tax in lieu of the mileage fee because the readers at retail fueling stations would not read the VMT data. If a system-wide failure occurred for some catastrophic reason (e.g. satellite signaling interruption), the fuels tax would be reactivated for all motorists traveling on Oregon roads with no change of motorist tax paying behavior required.	☑ **Seamless Transition Must Ensure Stable Transportation Revenues for Oregon's Roads.** Transition from the per-gallon fuels tax payment system to a per-mile payment system should be designed to avoid disruption in revenue collection. ☑ **System Redundancy.** In the unlikely event of technological difficulties or widespread tampering with the electronic mileage fee system, a reliable back up system should be built into the new system to ensure the system is not entirely at risk.
IS THE SYSTEM AND ITS RELATED TECHNOLOGIES RELIABLE AND AFFORDABLE? **Oregon State University Research Specialists Select from Proven Technology.** Through a recent series of successful trial runs, OSU researchers have publicly demonstrated that the mileage fee technology included in the proposed set of recommendations is feasible. ODOT and OSU are working with leading industry experts to continually refine, test, evaluate and update technology and system design to maintain reliability and security. **Capital and Administrative Costs Are Minimized through Appropriate Policy and Technology Choices.** System design ensures affordability. The on-vehicle technology will be designed and installed by the vehicle manufacturer and embedded in the price of the vehicle, with no expensive retrofitting of vehicles. Statewide capital costs for fueling station equipment and computing technology will be less than $35 million. If bonded, this cost will result in less than a two percent increase in the mileage fee rate.	☑**Technology that is Feasible, Reliable and Secure.** The technology used in the new mileage fee system should not have unmanageable technological difficulties. ☑ **System Affordability.** A new mileage-based system must have reasonable capital cost requirements and annual operating costs, comparable to those associated with the current fuels tax on gasoline.

Source: Oregon Department of Transportation Office of Innovative Partnerships and Alternative Funding (May 2005).

3.3 MILEAGE FEE SYSTEM SPECIFICATIONS: DATA SECURITY, REVENUE ACCOUNTABILITY AND PROTECTION OF USER PRIVACY

3.3.1 Introduction

This section details the process recommendations and technical options for the Oregon mileage fee concept. The process recommendations are advisory, based on technical study results and policy considerations. If there are additional technical design options that can be considered in either the Pilot or ultimate program deployment, these are identified in the text boxes found at the end of each subsection beginning in subsection 3.3.3.

3.3.2 Guidelines for Technical System Development

In March 2003, the Task Force directed ODOT to develop the mileage fee concept to meet the requirements set forth by the policy framework identified in the right hand column of Table 3A of this 2005 Report. In an immediate, practical sense, the development of the concept was also oriented toward a prototype mileage fee system design, the feasibility of which could be tested as part of a planned Mileage Fee Pilot Program, in accordance with Chapter 862, Oregon Laws (2001).

3.3.3 ODOT's Technology System Requirements

The specific directives ODOT provided to OSU emphasized the need for the technology to be developed by OSU to satisfy customer (i.e., future mileage fee payers) preferences as understood by ODOT, and to respect and address customer concerns and constraints. These customer preferences for the technology are consistent with the policy framework of Table 3A and were refined, elaborated and organized in a December 2003 report, *Sub-task 1.1 – P240S Stakeholder Needs*, prepared by OSU researchers David S. Kim and J. David Porter, provided in summary form below, and in an expanded version in Appendix D to this report. On April 16, 2004, OSU delivered and demonstrated to ODOT a technology configuration that met these requirements.

Table 3B: Mileage Fee System Requirements Established by ODOT

- The system developed will simulate a real implementation of an electronic mileage-based (VMT-based) revenue collection system.
- The systems developed must not "track" drivers to a greater degree extent than existing payment systems (e.g. credit cards) permit.[19]
- The systems developed do not require any additional actions on the part of motorists relative to what occurs today.
- Mileage data (VMT) collection within predefined geographic zones is accurate.
- On-vehicle devices can be installed in secure "out of sight" locations on vehicles.
- On-vehicle devices are accessible for replacement or maintenance purposes.
- The system and its components are secure and tamper resistant.
- The system indicates to the user the amount spent for fuel and the amount of mileage fee paid.
- The system can be phased in over time and accommodate out of state drivers.

Document functional and technical specifications for the systems and system components.

Source: Kim and Porter, ODOT: Stakeholder Needs, Appendix D

3.3.4 Protection of Privacy

High on its list of ODOT concerns was the need to maintain the privacy of Oregon citizens. ODOT thus directed its technology development consultant, the Oregon State University School of Engineering (OSU), to develop the technology to support the mileage fee concept in accord with the Task Force requirements, again emphasizing the need to eliminate or maximally reduce the privacy concern about the proposed technology. In this section additional specifics are provided on how the technology is designed to maintain the privacy of motorists.

The major concern regarding the potential loss of privacy brought about with the Oregon mileage fee system is the use of GPS technology, and the ability of the government to use the mileage fee system to "track" motorists' movements. To better explain how the Oregon mileage fee technology incorporates GPS technology while still maintaining the privacy of motorists, the phrase "GPS technology " will be clarified as will the concept of "tracking motorists". This will be followed by a discussion of commercially available GPS devices and their components/functions that enable varying levels of "tracking". These functions/components will then be compared to the technology used in the Oregon mileage fee system, which is designed to maintain privacy.

The phrase "GPS technology" will likely have different meanings to different readers based on each individual's use and exposure to GPS products. In the Oregon mileage fee system the phrase "GPS technology" refers to a "GPS receiver" (also referred to as a GPS engine or GPS module). The GPS receiver has the ability to generate location and time data but, in general, it

[19] This privacy requirement morphed over time—as the ODOT came to a better understanding of the privacy protection needs of the general public—to provide an additional element for protection of the driving history of motorists. To this end, this second bullet of the ODOT mileage fee system requirements functionally became, "The systems developed must not store or transmit precise vehicle location." The technology designed by OSU for the pilot program ultimately met this requirement as well.

cannot by itself transmit this information wirelessly, or save a large amount of these data. The use of the data produced by the GPS receiver differs for different products and will require additional hardware and software features. These differences are what determines the capabilities of various "GPS products" and whether they can be used for "tracking".

With the use of GPS technology in the on-vehicle devices as part of the Oregon mileage fee system, the concern of some motorists is that they will now be "tracked" by the government. In this context, "tracked" is interpreted to mean that the detailed movements or routes (including times) of motorists can be produced, either as the motorists are driving, or sometime after they have completed a driving trip. For clarity, the first type of tracking defined will be called "real time" tracking, and the second type will be referred to as "historical" tracking. In order to accomplish either type of tracking, frequently generated location points along with times must be produced and saved. The difference in the two types of tracking lies in how soon after the location data is obtained that the vehicle route can be constructed.

In real time tracking the location and time data must be sent via some means to the government (or other centralized location) shortly after it is generated. A common method used to transmit these data is cellular communications. General Motors On-Star system has this ability, although it is not used in the manner described to track a vehicle. However, there exist commercial products targeted at fleets of commercial vehicles that are designed to track vehicles. There are a variety of reasons a company may choose to use such a system but often cited reasons are driver safety, asset control, and accurate predictions of arrival times. Many handheld commercial "GPS units" used for personal navigation also generate a route as the individual is traveling, but this route data are self contained and not transmitted as it is generated.

To implement historical tracking the location data and time data generated by the GPS receiver must be saved as it is generated in such a manner that it can be accessed later. In the case of vehicles, travel routes can then be reconstructed from this data. Commercial products with such capabilities are common and are used by companies to track the movement and use of company vehicles. Similar products have been used by rental car companies and insurance companies. Many handheld "GPS units" used for personal navigation have the ability to "download" route data.

In the Oregon mileage fee system the on-vehicle devices have GPS receivers but utilize the location and time data differently than some of the GPS products discussed. The location data is used to only answer the questions, "Is the vehicle traveling in Oregon?" and, "Is the vehicle traveling in a smaller jurisdictional area such as a city?[20]" The answers to these questions are a simple, "Yes," or, "No," with no specific location data being saved within the devices or transmitted to another entity. Thus, under the Oregon mileage fee technology developed by OSU, it is impossible to track the location or movements of motorists either historically or in real time. [21]

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[20] The application of the Oregon mileage fee system to jurisdictions smaller than as state could facilitate an effective application of peak-period pricing. The Task Force believes the best application or peak-period pricing would be via area pricing. "Area Pricing" charges a fee for VMT within a defined area during set peak hours. The fee applies to use of all highway facilities (i.e., roads, streets, bridges and highways) without differentiation by jurisdiction or type of facility.

[21] Some respond to the information that government tracking of motorists is impossible under the Oregon system by asserting that using a device with a GPS receiver is a dangerous "first step" in that direction. Those making such assertions should ask how such tracking could actually be accomplished. For tracking of individual motorists to

3.3.5 Data Collection Technology

As reported in the 2003 Legislative Report, ODOT's Oregon State University consultants proposed two possible electronic data collection, storage and transmission technologies. One was based on the vehicle's odometer. A second was based on a global positioning system (GPS) receiver. Both systems met the ODOT system requirements. At the time of the 2003 Legislative Report, the Task Force had not settled on which electronic device it would endorse but recommended testing both.

- **Odometer-Based Technology**
  The odometer-based technology obtains information from the vehicle's speed sensor to measure mileage traveled. The collection of miles driven in Oregon is turned off and on as a vehicle leaves and enters Oregon, through the use of wireless "gantries" at the state borders. Mileage data is stored within the vehicle's computer and then read wirelessly by radio frequency readers.

- **GPS Receiver-Based Technology**
  The GPS-based technology uses a GPS receiver that triangulates (determines) its own position from signals received from at least three GPS satellites, resulting in a geographic position—longitude and latitude. These data can be used to measure mileage traveled. [Note: In the application of this technology, no signal is sent by the GPS receiver to the satellite system nor received by the satellite system.] Mileage traveled data is stored within the vehicle's computer and then read wirelessly by radio frequency readers.

ODOT ultimately recommended that the odometer-based technology and the GPS receiver-based technology be combined into a hybrid, taking the best attributes of both to enable an accurate and cost-efficient system.

- **Hybrid Odometer/GPS Technology**
  The hybrid technology uses the odometer's speed sensor to measure miles traveled and a GPS receiver to indicate which zone the vehicle is traveling in (and thus what zone mileage "odometer" should accumulate mileage).

Thus, the hybrid odometer/GPS technology combines the odometer's accuracy at measuring miles traveled with the GPS receiver's precision and flexibility to differentiate zones.

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occur, another law must be passed – which ODOT has no desire or intention of seeking – to authorize a government agency to add continuous transmission technology to the on-vehicle device for vehicles without it (or gain access to continuous transmission technology for vehicles already containing it) or to create an electronic driving record that a government agency is authorized to access. Given prevailing public attitudes towards privacy protection, we ask the rhetorical question, "Does anyone think such a law would ever pass?"

Policy Option #1. ***Zone Switching by Overhead Gantry Infrastructure (Abandonment of GPS).*** *If the motoring public and legislative policymakers prefer, GPS receiver zone switching could be abandoned in favor of overhead gantry infrastructure to perform the function of acting as a switch for telling the vehicle's computer in which zone the odometer should accumulate miles driven. This option would be similar to the weigh-in-motion system Oregon now uses for heavy trucks. Use of gantries would have five major consequences. First, use of overhead gantries would require additional system costs because they would have to be installed at every border crossing in Oregon. Second, the gantry infrastructure would be highly vulnerable to tampering in areas with less opportunity for law enforcement oversight. Third, overhead gantries would hamper the ability to implement local option for incremental mileage fees above statewide levels. Fourth, overhead gantries would eliminate the possibility for an area pricing application of variable and peak period pricing. Fifth, use of overhead gantries would limit the adoption of the mileage by other states because the gantry technology would only have the ability to tell the vehicle's computer when the vehicle is inside Oregon and when it is outside Oregon, thus precluding differentiation of other states for multi-state application.*

Policy Option #2. ***No Zone Switching.*** *Should policymakers desire to avoid issues related to electronic zone switching altogether, policymakers could decide to require collection of a mileage fee for all miles a resident motorist drives, whether or not driven within the state. This is how fuels taxes are collected now – motorists pay fuels taxes whether or not the fuel is expended within the state. Such a policy could lead to unintended double assessments for some motorists. For example, a resident motorist who drives substantial miles out-of-state (and thus purchasing substantial amounts of fuel in the non-resident state) could end up paying fees and taxes for the same miles driven to more than one state if the resident state adopts a mileage fee with no zone switching and the non-resident state stays with the gas tax.*

3.3.6 Data Transmission

As reported in the 2003 Legislative Report, the Task Force proposes using short-range radio frequency for transmission of mileage data. As part of its overall and integrated set of privacy protections, the Task Force wants to avoid systems with broad transmission range capability, such as cellular, that would enable tracking of vehicular movements. The OSU researchers report that the maximum range for radio frequency technology is 300 feet but expect to refine this technology so that transmission will be limited to the particular reader aligned with the fueling pump, thus preventing data theft. In addition, the on-vehicle technology is considered "passive" for the purposes of VMT data transmission; this means that on-vehicle devices will only transmit data when instructed by the reader. Short-range radio frequency cannot be used by any entity to track vehicular movements.

ODOT had several conversations with privacy advocates on the issue of privacy protection. After thorough review of the technology upon which the Oregon mileage fee concept is based, certain privacy advocates retained a concern that law enforcement officials may be able to use the electronic vehicle identification element to measure highway speeds for purposes of electronic citations for speeders.

Policy Option #3. ***Legislative Prohibition on Specific Law Enforcement Uses.*** *Legislative policymakers could prohibit law enforcement agencies from using electronic data reading systems for the purposes of electronic ticketing of speeders. (As stated elsewhere in this report, systems will be in place to protect citizens against other unauthorized use of their data, and to minimize the need for collection, transmission and storage of identifying data.)*

3.3.7 Fee Calculation

ODOT's technology researchers at Oregon State University identified and field tested two possible electronic scenarios for calculating the fee at fueling stations. Neither scenario would involve service station personnel in the transaction to a greater degree than is currently required for calculating the fuels tax on gasoline. The first (recommended) scenario for calculating the fee uses one-way communication that takes data from the vehicle to a central computer and does not return information to the vehicle. The second possibility, two-way communications between reader and vehicle, is presented as Policy Option #4.

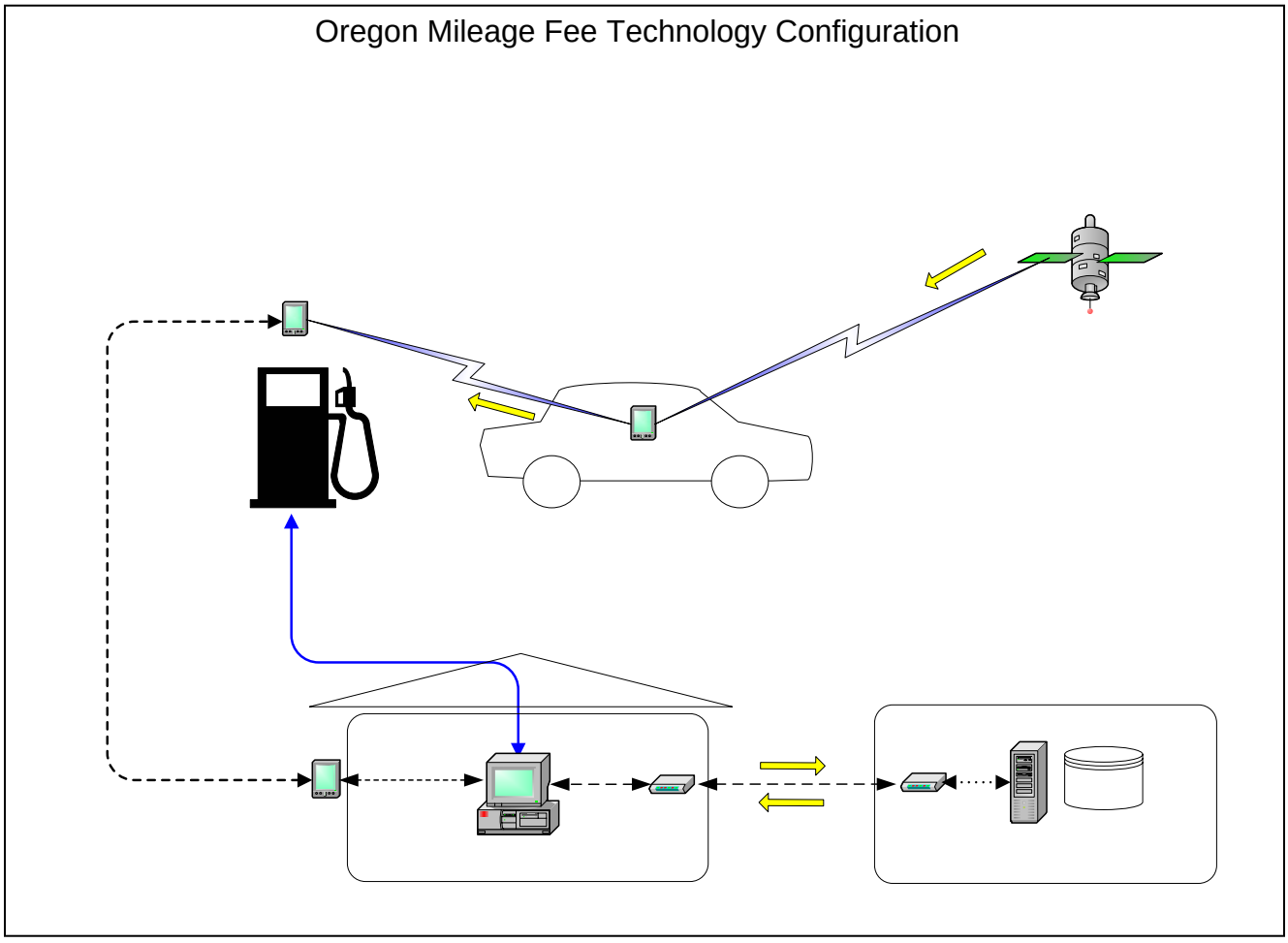
- **One-Way Communication: Interaction with ODOT Central Computer.**
  A wireless data reader at or near a fuel dispenser will read the stored VMT data from a vehicle's device (one-way communication) and send these to a host computer located at the service station. The host computer will send a request for the vehicle's prior "paid for" zone mileage to a central processing computer. The central computer will send this information back to the service station's host computer, which will compute the VMT fee. The host computer will interface with the existing service station POS system and direct the POS system to incorporate the proper fee into the fuel purchase transaction in lieu of the gas tax, and notify the host computer of a completed transaction. The host computer then communicates with the central computer that the transaction was completed, and transfers the new latest "paid for" zone mileage to the central computer for updating. No re-setting of the vehicle's mileage data occurs.

Policy Option #4. ***Two-Way Communication: Automatic Electronic Re-Setting of Odometer.*** *Wireless data readers at or near a fuel dispenser will read two mileage readings from the device (Total Oregon VMT and Total Paid-for Oregon VMT). This data will be passed to a local host computer located at the service station. The host computer will calculate the difference between the two mileage readings (resulting in Oregon VMT for which a fee has not been paid) and compute the proper VMT fee. This data will be made available to the point-of-sale (POS) system, which will include it in the fuel purchase transaction in lieu of the gas tax. After completing the transaction, the host computer will instruct the on-vehicle device to copy the Total Oregon VMT mileage value to the Total Paid-for Oregon VMT category.*

3.3.8 Oregon Mileage Fee Technology Configuration

Figure 3A illustrates the recommended technology configurations as discussed above, and shows the flow of information required for accurate and secure fee assessment.

Figure 3A: How Mileage Fee System Features Support Policy Framework



Source: ODOT Office of Innovative Partnerships and Alternative Funding (2005)

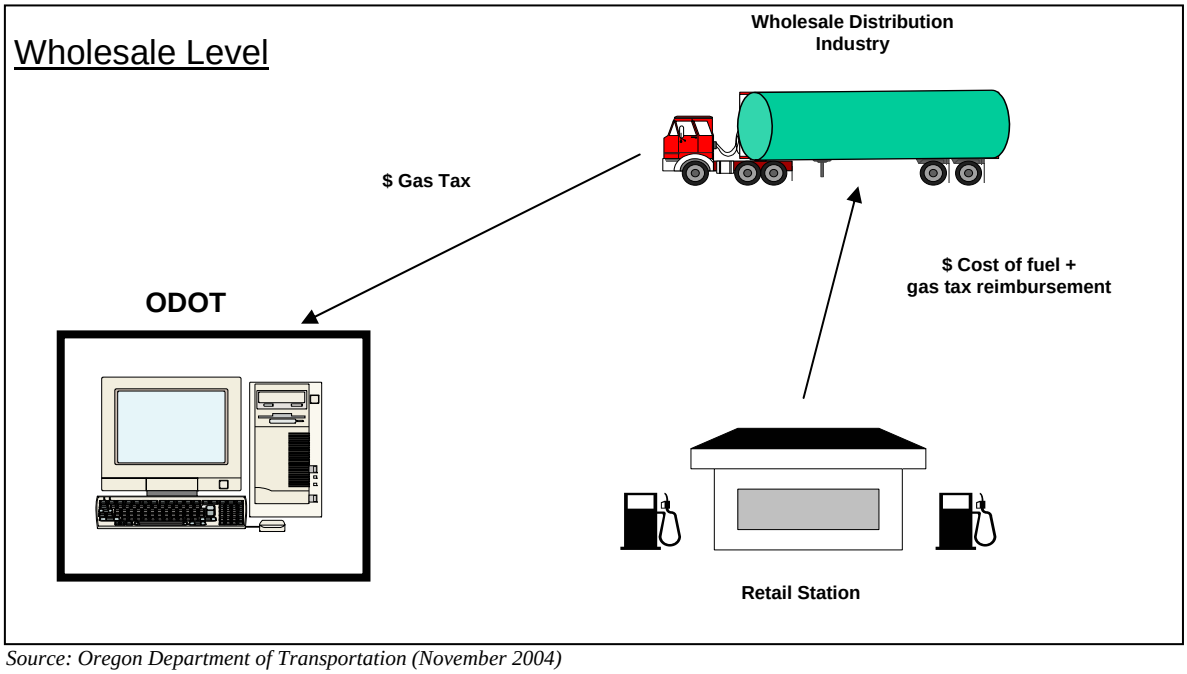
3.3.9 System Administration

The principal administrative challenge associated with the mileage fee is how to ensure proper crediting of state fuels tax payments for gasoline purchases by motorists who pay the mileage fee. This task must be accomplished in order to deduct that gas tax amount from the sale price. There must also be a way of accounting for the two types of fees (state gasoline tax and mileage fee) throughout the revenue collection pathway. This issue is particularly thorny because, for purposes of state revenues, fuels tax payments for gasoline do not occur at the retail service station but rather at the first point of wholesale distribution in the state (i.e. "at the rack"). Retail stations then reimburse the gasoline distributor and the motorists, in turn, reimburse the retail stations. Given the existing tax assessment structure, an administrative system designed to address the integration of mileage fee collection with state gasoline tax was developed; it is called Vehicle Miles Traveled Collected at Retail (VMTCAR). VMTCAR is described below.

Under the existing state gasoline tax collection system, when a retail station collects gas tax reimbursement payments from the motorists, the amount collected automatically matches up with the reimbursement paid to the distributor, because it is based on fuel volumes at the distributor/retailer transaction and at the pump, for all motorists. However, upon implementation of a mileage fee, that situation will change. In that case, even after deducting each individual motorist's redundant state gasoline tax from a gasoline sale to a mileage fee customer, the aggregate mileage fee collected from customers each month, plus the state gasoline tax collected from those customers continuing to pay it, will almost certainly fail to match the reimbursement already paid by the retailer to the distributor. Depending on the mix of vehicles refueling at a given retail station, sometimes the amounts collected will be higher and sometimes lower than if the service station sold fuel only to non-equipped vehicles subject only to the state gasoline tax.

To solve this problem, ODOT developed an electronic accounting mechanism, a "truing up," that will allow for ODOT billings to the retailer if the amount collected at the pumps is higher than paid to the distributor for the gasoline delivered and ODOT reimbursements to the retailer if the amount collected is lower than the amount paid to the distributor. Figures 3B, 3C and 3D illustrate the process schematically. Figure 3B (VMTCAR at Wholesale Level) illustrates the flow of revenues from state gasoline taxes as they occur now, and which would remain unchanged under a mileage fee. Thus, the wholesaler remits state gasoline tax to ODOT, and the retailer reimburses the wholesaler for the amount of those taxes.

Figure 3B: VMTCAR at Wholesale Level

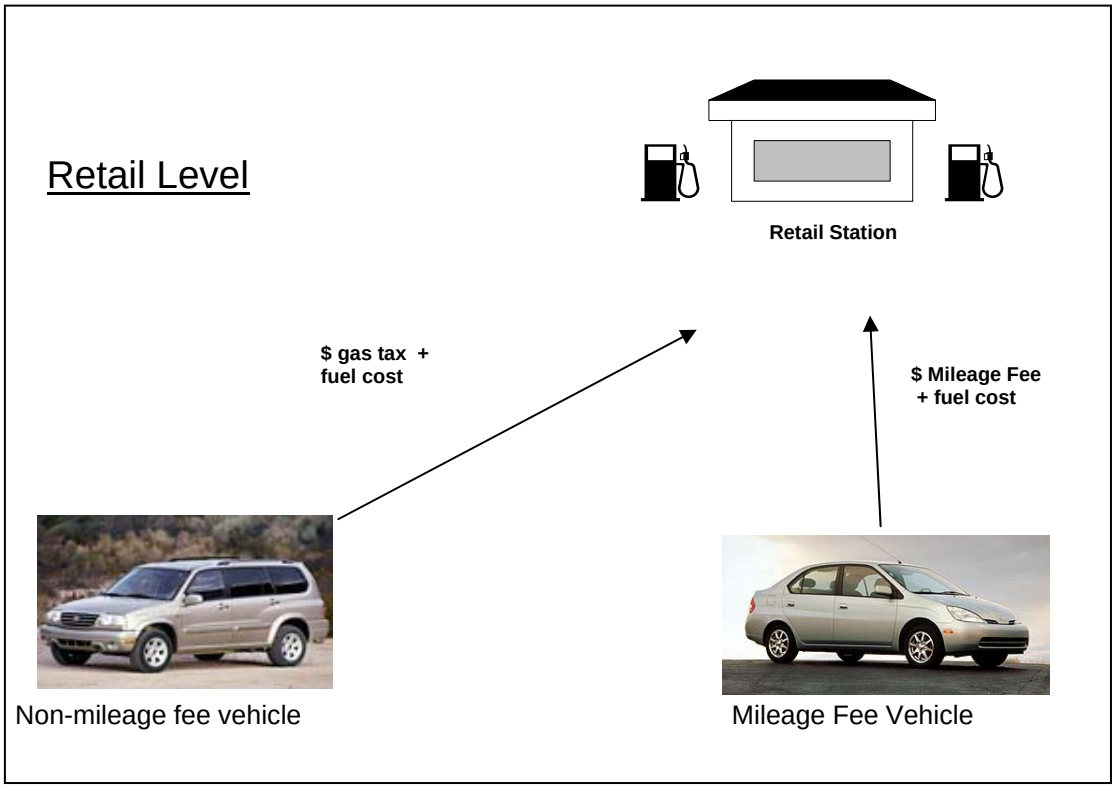


Source: Oregon Department of Transportation (November 2004)

Figure 3C (VMTCAR Revenue Flow at Retail Level) shows how the retail gasoline station collects the fuels taxes from motorists at the POS under a mileage fee scenario. At the retail level, the service station customer will purchase fuel as he or she does now. Those motorists with non-equipped vehicles (gasoline only) will pay their state gasoline tax at the pump, as they always have. Those with vehicles equipped for the mileage fee will do likewise—however, an electronic calculation will be included in the process, whereby the state gasoline tax is deducted

and the mileage fee is added to the price of fuel, in the case of gasoline purchases. Alternative fuels vehicles, as they arrive at market, would also be subject only to a mileage fee. With respect to state gasoline taxes, retailers continue to collect taxes, after having already paid the gasoline distributor for the fuel *plus* the state gasoline tax.[22]

Figure 3C: VMTCAR Revenue Flow at Retail Level

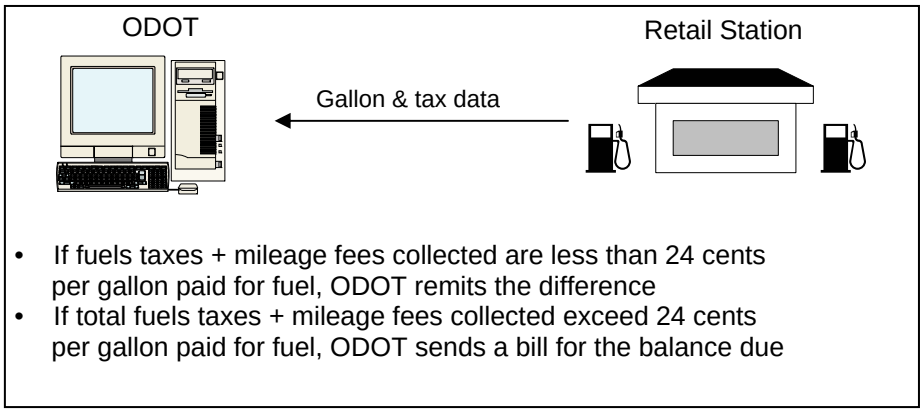


Source: Oregon Department of Transportation (November 2004)

The benefit of the VMTCAR "truing up" as shown in Figure 3D is to remove the burden of accounting for taxes and fees from the shoulders of employees at service stations, and instead to accomplish it electronically. Adjustments are handled easily, accurately and efficiently through regular billings or reimbursements, as appropriate.

[22] Alternative fuel vehicles are currently subject to a Use Fuels tax (this includes diesel for vehicles not subject to Oregon weight-mile tax) of $0.24 per gallon equivalent, imposed at the retail level and remitted to ODOT by retailers. Although this tax is still minimal in terms of the number of vehicles currently paying the tax, expected market penetration of alternative-fueled vehicles would increase the number of vehicles subject to the Use Fuels tax, absent the mileage fee.

Figure 3D: Final Step in Tax/Fee Collection: VMTCAR "True Up" Transaction between Retailer and ODOT



Source: Oregon Department of Transportation (November 2004)

As previously explained, gasoline tax collection at the distributor level will remain the same. Gasoline tax reimbursements from the retail station to the distributor at the point of distribution will remain the same. The only change will involve the information submitted to ODOT to determine how the true up transaction will occur. ODOT will electronically receive from the retail stations the following information necessary in order to account for the amount of revenue owed to ODOT (or to be reimbursed to retailers by ODOT):

- Concurrent reporting of the amount of gallons of fuel purchased by customers at the station subject to VMT charges for a given period; and
- The amount of mileage fees paid by mileage fee payers during the same period.

This information will allow ODOT to manage the truing up mechanism. For stations owing revenue to ODOT, invoices would be mailed monthly. For stations getting a reimbursement by ODOT, the payment would occur weekly.

The VMTCAR truing up method will minimize the involvement of retail station personnel because of the reliance on real time electronic transfer of data. Service station attendants will not be required to change their current behavior. The only additional burden is for retail stations to manage either a billing a month or a reimbursement payment once per week. Processing these transactions via electronic deposit should further mitigate any additional burden on the stations. The motoring customer will experience no operational difference between paying a per-gallon charge and paying a per-mile charge, although there will often be slight differences in the payment amount if compared on a per-gallon equivalent.

There are many features of the VMTCAR "true up" process that render the mileage fee system viable administratively**,** including:

- **Mileage Fee Gradually Replaces Gas Tax**
  Since the gas tax remains the primary revenue collection mechanism with the service stations only paying the mileage fee differential, the bulk of the mileage fee revenue system remains with stable fuel distributing businesses upon which the gas tax revenues are based. The reliable gas tax payment system will only gradually be replaced by the mileage fee system. (See Appendix E for an analysis of the gradual shift of mileage fee

collection through the gasoline tax collection mechanism to the collection at service stations.) The long transition period allows (1) assessment of risk points and revenue leaks before mileage fee payments become the dominant portion of the revenue stream; (2) convenience to the private fuel distribution industry; and (3) appropriate compliance mechanisms to be developed for retail service station payments.

- **Bulk of Revenue Stream Remains at the Distributor Level (Fewer Taxpayers)**
  Initially, and for many years, most state highway revenue will continue to come from the gas tax, not the VMT, until vehicles are equipped with VMT technology. For the initially small (but steadily growing over the years) VMT revenues collected at the pump, only the excess of VMT charged over the gas tax already paid by the retailer to their supplier will be paid by the retailer to ODOT. Because of this, the bulk of VMT will already have been collected as part of the normal gas tax collection process.

- **Retain Current Auditing Procedures and Multi-State Anti-Evasion Processes**
  Retaining gas tax collection as the bulwark of the road revenue system will protect the new mileage fee system through application of the current ODOT auditing procedures and multi-state anti-evasion processes. Interstate anti-evasion processes for the mileage fee will develop over time as other states adopt and implement the mileage fee concept.

- **Fuels tax Retained as Redundant System**
  Continued payment of the gas tax "at the rack" as the underlying mechanism supporting the mileage fee system provides system redundancy in the event of widespread system failure and technology tampering. In the event of extraordinary occurrences hampering the mileage fee system, the gas tax collection system will continue to operate without a hitch. The only revenue lost will be the differential between gas tax supported collection and the mileage fee payments made by retail service stations.

System Option #5. ***Advanced Payment of Mileage Fees***. *The existing gasoline tax charges motorists for future consumption—that is, they pay the tax and then use the gasoline (and the road system.) The mileage fee as described thus far, however, charges motorists for past use of the road system. A way to make the mileage fee payment act more like the fuels tax on gasoline, in the sense of charging for future use, is to design the mileage fee to assess future mileage that will be traveled as a result of a refueling. This would allow revenue collection in advance of miles driven much like gas tax revenue collection occurs in advance of fuel consumption. ODOT has designed such a method -- Predictive Adaptive Vehicle Miles Traveled (PAVMT). Under PAVMT, mileage fee payments at service stations by individual motorists would be based on the predicted number of miles to be driven determined by the number of gallons purchased for the vehicle and the estimated fuel economy of the vehicle. Initially, for new vehicles, the estimated fuel economy would be determined by ratings of the United States Environmental Protection Agency. According to the PAVMT model, this fuel efficiency estimation would adapt over time to the actual fuel economy experience for the vehicle.*

3.3.10 Auditing

The Oregon Mileage Fee Concept assumes a transition period during which the majority of tax payments to ODOT will gradually shift from the distributor to the retailer over a lengthy period of time. Thus, in the early years most of the ODOT compliance resources will strategically focus on the fuels tax revenue stream paid by the wholesale distributor. By maintaining the fuels tax collection mechanism as the underlying road revenue source, proven fuels tax audit procedures and inter-state cooperative tax compliance measures will continue to be applied. Thus, as noted above, the bulk of highway fund revenues will be protected from any transition difficulties that could arise from implementing the mileage fee.

To ensure a high level of mileage fee compliance, measures focused on potential evasion at retail stations and with individual vehicles will necessarily be refined. As part of ensuring optimal compliance by motorists and service stations, electronic data for each fueling transaction transmitted from retail fuel stations to ODOT must necessarily include the following:

- Vehicle miles traveled for all zones,
- Amount of fuel purchased,
- Station identification,
- Date of transaction, and
- Vehicle identification.

Effective system audit and compliance efforts would likely include the following steps:

<u>For individual vehicles:</u>

1. Electronic analyses of vehicle miles traveled and gallons purchased to identify unaccounted for mileage in excess of stated tolerance levels;
2. Standard procedures to investigate and resolve mileage discrepancies; and
3. Regular and ongoing inspection and testing of random samples of vehicle mileage counting devices and physical odometers in a manner that does not unduly inconvenience motorists.

<u>For retail stations:</u>

1. Comparison of gallons sold subject to the mileage fee versus mileage totals recorded at the station to identify variances above stated tolerance levels;
2. Periodic inspection and testing of mileage fee recording and point-of-sale equipment; and
3. Observation of fueling operations to observe non-compliant practices.

The Task Force noted in its 2003 Legislative Report that evidence of tampering or intentionally damaging the mileage fee equipment should be cause for monetary fines.

Policy Option #6. ***Additional Limits on Information Stored in ODOT Central Computer***
Should the motoring public and legislative policymakers desire greater protection of privately derived information, the mileage fee transaction privacy could be structured to prohibit ODOT from acquiring or retaining the vehicle identification for audit purposes. The consequences of eliminating ODOT access to this critical piece of analytical auditing information will make compliance assessments less timely, less certain, and more expensive to obtain. The impact on compliance measures would be as follows:

- *Periodic individual physical compliance would replace electronic data processing analysis for vehicles.*
- *Electronic data processing analysis for retail stations would necessarily use statewide fleet miles-per-gallon, making it less exact, subject to higher tolerances, and making evasion more difficult to identify.*
- *Significantly more personnel would be required for physical inspection and testing of vehicles and stations in order to gain the same level of compliance assurance as would be probable if vehicle identification data were available.*
- *Compliant drivers and stations would be inconvenienced since the targeted compliance abilities of electronic data processing analysis would not be available.*
- *All drivers may be required to retain fuel purchase invoices as evidence of mileage fee paid to avoid being assessed for unaccounted for miles.*

3.3.11 Cost of Statewide Implementation of Technologies Supporting Mileage Fee Collection

Since the 2003 Legislative Report, and as a consequence of extensive analysis and evaluation of findings, ODOT and the Task Force have determined the Oregon Mileage Fee Concept to be affordable.

- **Cost of On-Vehicle Technology**
  The per-unit cost of the on-vehicle prototype is less than $250, and the cost on a mass produced basis is expected to be significantly less. The likelihood of the marketplace providing the necessary technology for collection of the mileage fee for its own business reasons is growing rapidly. On February 2, 2005, General Motors announced that all of its 2007 models would have GPS receiver-based navigation capability as standard equipment. Task Force administrative staff has also learned from automakers that wireless data transmission capability is also likely to become standard equipment during the next ten years. By the time for implementation of the Oregon Mileage Fee Concept, it is probable that a legislative mandate requiring on-vehicle technology to support mileage fee collection will be moot. The only legal mandate required may be for a software upgrade to allow for mileage segmentation into zones.

- **Cost of Fee Collection Technology for Service Stations**
  The cost of providing mileage fee collection technology for service stations will vary according to the nature of the existing POS systems at service stations and the number of pumps per service station. For service stations with an older point-of-sale (POS) system, an entire replacement POS system may be required. For more modern service stations with a Windows-based POS system, all that may be necessary is an inexpensive software upgrade. All service stations will require mileage data readers at the approximate cost of $290 per pump.

- **Cost of Central Computer System and Database**
  ODOT will require establishment of a central computer database to support interaction with service station POS systems during the mileage fee transaction.

Financing Capital Costs

Since the cost of on-vehicle equipment should be minimal, this cost should be built into the price of new vehicles. The remaining capital costs for service station technology and an ODOT central database is estimated by an ODOT economist to be less than $35 million statewide. This amount could be bonded over 20 years, resulting in less than a 2 percent increase in the mileage fee rate to service the debt.

Table 3C: Mileage Fee Capital Cost Estimates

Mileage Fee Capital Costs Estimate	
Data Transfer:	
Equipment	$3,874,000
Software	$2,250,000
Installation	$10,800,000
Other Service Station Infrastructure:	
Point-of-Sale System Improvements	$9,171,000
Dedicated Telephone Lines	$236,000
Contingencies	$5,270,000
Total Service Station Capital Costs	$31,601,000
State System Capital Costs, Including Contingencies	$1,200,000
Total Capital Costs	**$32,801,000**
*Assumes 1800 service stations in Oregon,	
including cardlock stations.	

Source: Oregon Department of Transportation (April 2005)

3.4 OUTSTANDING ISSUES

3.4.1 Fee Rate

The Task Force found that in order to provide revenues that are equivalent, on a per-mile basis, to those deriving from the current 24 cent per gallon fuels tax rate on gasoline, the mileage fee rate would have to be 1.2 cents per mile. This is determined by dividing the 24 cent gas tax rate by the current average fuel efficiency of passenger vehicles of 20 miles per gallon (i.e. .24/20=.012). The Task Force defers to the legislature on the issue of whether to increase the mileage fee rate above 1.2 cents per mile, now or in the future, and thus makes no recommendation in this regard.

3.4.2 Fee Structure

A principal issue for legislative policymakers in adopting a mileage charge is the rate structure. The mileage fee could be structured in various ways – a flat rate, a graduated rate or a rate that might be applied only to high mileage vehicles, as defined by policymakers. The Task Force prefers a flat rate for reasons of simplicity and consistency with the Task Force's philosophical view that every passenger vehicle burdens the road system to the same degree and thus should bear the same burden for maintenance and improvement of the road system. The Task Force found the view that heavier passenger vehicles cause more damage to the road system was false. The Task Force determined that modern roads are built to sustain the impact of 50 ton trucks and that the difference in road damage caused by a one ton automobile and a four ton automobile was insignificant.

There are numerous policy considerations in setting a rate structure.

- **Flat Rate**
  All vehicles require the same level of service from the road system. All vehicles need occupying space, signaling, bridges, braking capacity, proper pavement condition, signage, entrances, exits and safety features. If designed as a true user charge, the mileage fee rate would have a flat rate per mile driven. Thus, as a true user charge, all light vehicle motorists would pay the same rate for each mile driven notwithstanding the type of vehicle operated or any other variable.

- **Environmental and Energy Policy**
  If a mileage fee were imposed on a flat fee basis, the new system would advantage some vehicles and disadvantage others when compared to the tax burdens placed on motorists under the current fuels tax on gasoline. For example, motorists driving a vehicle with low fuel economy (i.e. less than 20 miles per gallon on average) would pay less tax per mile driven under a flat mileage fee than under the current gas tax. On the other hand, motorists driving a vehicle with higher fuel economy (e.g. more than 20 miles per gallon on average) would pay more tax per mile driven under a flat mileage fee than under the current gas tax. Some oppose the flat rate because they value environmental and/or energy policy concerns above road capacity or user responsibility concerns.

- **Social Equity Concerns**
  Unless designed with social equity in mind, the road revenue system, existing or future, will have a disproportionate burden on lower income motorists. The more fuel-efficient vehicles entering the marketplace, being new, will be purchased by the more affluent

motorists. The less affluent motorists, on the other hand, will purchase vehicles on the secondary market. Vehicles on the secondary market will be the older, less fuel-efficient vehicles (e.g. the older SUVs without the hybrid option) which also tend to lose fuel efficiency as they age. A rate structure that disadvantages the operation of low fuel efficient vehicles would tend to place a burden on the portion of society with lower incomes.

Policy Option #7. ***Combined gas tax and mileage fee systems.*** *One way to combine the user fee philosophy with environmental and energy policy concerns is to design a mileage fee that encompasses objectives of both. If one assumes that every passenger vehicle bears a minimum responsibility for supporting and maintaining the road system but that motorists operating vehicles with low fuel efficiency ought to be encouraged to purchase new vehicles that are fuel efficient, then a combined gas tax and mileage fee system makes sense. Under such a system, vehicles with fuel efficiency ratings above 20-miles-per-gallon would pay a mileage fee. Motorists operating vehicles with a fuel efficiency rating of less than 20-miles-per-gallon would continue to pay the gas tax. Such a system, however, would continue to place a disproportionate burden on the portion of society that is less affluent, just as the current gas tax system does, unless assistance was also built into the structure.*

Policy Option #8. ***Graduated rate structure.*** *Another way to address the environmental and energy policy concerns is to design the mileage fee rate to be graduated into classes according to a selected set of factors. Each class could then pay a different fee rate depending upon the weighting desired by policymakers. The factors that could be used to sort vehicles into classes include fuel efficiency rating, weight, size or emissions rating. The base rate would be the same as for the flat fee, the policy basis being that every passenger vehicle demands the same of the road system. On top of the base rate, a premium fee structure could be applied to provide a disincentive for the use of passenger vehicles with particular characteristics chosen by policymakers.*

3.4.3 Variable Fees for Peak Period Pricing

The Task Force recommended in the 2003 Legislative Report that congestion pricing be part of the new road revenue system. Simply put, congestion pricing allows for collection of additional charges for motorists who drive on certain roadways during times of congestion. The Oregon mileage fee concept could accommodate development of precise strategies for peak period pricing to take into account the particular characteristics of individual communities. For example, cities could have several zones with various rates at different times of day. With sufficient computing power added to the mileage data collection technology, the strategies employed could be quite defined and precise.

Payment of charges for peak period pricing would occur at service stations as an amount added to the mileage fee. Service station operators would be obligated to remit the charges for peak period pricing to ODOT. See VMTCAR discussion in subsection 3.3.7.

As discussed in the 2003 Legislative Report, imposition of peak period pricing for a given community has legal constraints. Under the Oregon Constitution's equal protection clause, motorists driving motor vehicles equipped with the mileage fee collection technology must not be required to pay a congestion charge while motorists driving non-equipped vehicles have no

such requirement. Thus, until either all vehicles driven in Oregon are equipped with the necessary technology or another method is found to charge motorists driving non-equipped vehicles the same amount as those driving equipped vehicles, peak period pricing cannot legally be implemented.

Policy Option #9. ***No Peak Period Pricing****. Since the mileage fee is not dependent upon the availability of peak period pricing, a mileage fee system may be enacted without a peak period pricing element.*

3.4.4 Local Option

The Oregon Mileage Fee Concept could allow for local option rates as an addition to the statewide mileage fee. The data collection technology has the capability of delineating zones based on the boundaries of an individual city, county or other taxing district. Imposition of a local mileage fee rate would be simply a matter of defining the local zone and applying a local fee rate for that zone. Collection of the local option mileage charge would occur at service stations in the same manner as the statewide mileage fee. Service station operators would be obligated to remit the charges for local option to ODOT. ODOT would remit the local option fee collected to the local governments enacting the local option. The local option charge for a given community would be collected at wherever individual motorists pay the mileage fee, which could be inside or outside the local jurisdiction.

Policy Option #10. ***No Local Option.*** *A statewide mileage fee system could be enacted without a local option element.*

3.4.5 Retrofitting Versus Long Phase-In

While the Task Force prefers to step into the mileage fee slowly by applying the fee only to equipped vehicles—and therefore only to new vehicles not currently on the road—ODOT recognizes that phasing may result in an overly long waiting period for full system integration. At some point, the remaining unequipped vehicles may be retrofitted to allow for more creative pricing options for the state and local governments than application of a simple mileage charge. These options include congestion pricing, time-of-day toll lanes and various variable pricing schemes. Such pricing options will not be easily employed via the mileage fee collection mechanism until all Oregon vehicles contain the necessary mileage fee technology. While these options may be applied in a mileage fee format combined with a traditional variable pricing format, application via the mileage fee format alone will not be applicable for legal reasons requiring equal protection under Oregon's Constitution.

In the 2003 Legislative Report, the Task Force concluded that retrofitting of currently owned vehicles is prohibitively expensive. ODOT staff has noted additional disadvantages of retrofitting including (1) problematic placement of the technology not designed for retrofitted vehicles; (2) greater likelihood of tampering with the inelegantly placed technology within retrofitted vehicles; (3) the likelihood of a significant number of highly uncooperative vehicle owners; and (4) greater system implementation risk.

Policy Option #11. ***Paying for Retrofitting***. *Should policymakers desire to implement the mileage fee more quickly than the state fleet will turn over naturally in the marketplace, retrofitting of currently owned vehicles will be necessary. The expense and practical logistics of retrofitting will dictate either greater expense for a shorter implementation timeline or lesser expense for a longer implementation timeline. In the 2003 Legislative Report, ODOT estimated that one-year retrofitting schedule will cost about $1 billion. The report also showed it would cost less than $100 million to retrofit only currently owned vehicles.*

3.4.6 Home Refueling of Alternative Fuel Vehicles

With the advent of decentralized power and energy from alternative sources comes the potential and promise of convenient home refueling of motor vehicles. Already, consumer prototypes for electric and natural gas vehicles have been in use across the nation, and as prices for these home units drop, popularity will rise. Additional study and analysis by ODOT in the future should address this issue in the context of a mileage fee, in order to ensure all motorists are paying similarly for their use of the roads.

3.5 CONCLUSIONS

Since the last report to the legislature was issued in March 2003, ODOT and the Task Force have overseen development of a mileage fee system that is responsive to public policy requirements and concerns, notably related to privacy, system cost and practicality, and technological and administrative feasibility. In fact, all system policy requirements have been met without compromise. (See Table 3A.) ODOT is committed to maintaining and improving this close match between policy goals and quantifiable performance of this replacement for the gas tax, as the results from implementation, experience and new technologies become available.

CHAPTER 4
DEVELOPMENT OF A ROAD USER FEE PILOT PROGRAM

4.1 TASK FORCE RECOMMENDS POLICY FRAMEWORK AND EVALUATION CRITERIA FOR ROAD USER FEE PILOT PROGRAM

The Road User Fee Task Force recommended to the Oregon Department of Transportation the policy framework and evaluation criteria for a Pilot Program to prove the practicality of a mileage fee as well as a peak-period pricing strategy. ODOT is charged with the statutory responsibility of developing and operating the Pilot Program. ODOT intends to develop and operate the Pilot Program as closely as possible to the Oregon Mileage Fee Concept approved by the Road User Fee Task Force. The steps taken between April 2003 and June 2005 toward development of the Pilot Program are reported in this chapter, as required by law[23].

4.2 ODOT DEVELOPMENT OF THE ROAD USER FEE PILOT PROGRAM 2003-2005

In 2003, the Task Force recommended ODOT test the feasibility of the Oregon Mileage Fee Concept with a congestion pricing component for the Pilot Program, for which grant funds were received from the Federal Highway Administration and supplemented by an ODOT match. The Task Force developed numerous standards and criteria that guided ODOT's development and design for the Pilot Program, described below.

4.2.1 Technology Development

A number of technological challenges had to be addressed and decisions made in order to develop a practical test of the Oregon Mileage Fee Concept. In 2003 ODOT began working with Oregon State University's College of Engineering (OSU) to design an operational test for the Road User Fee Pilot Program. ODOT prepared a set of project objectives and customer (user) needs that provided technical standards and parameters for the OSU researchers[24]. (See Appendix D.)

Below is a chronological list of tasks ODOT has completed in preparation for launching the Pilot Program.

Chronology

- Developed functional requirements and technical specifications for an integrated GPS/AVI device for electronic mileage calculation.
- Developed functional requirements and technical specifications for an integrated odometer/AVI device for electronic mileage calculation.

[23] Oregon Laws 2001, Chapter 862, Section 2, Paragraph (9), which states, "The Task Force shall report to each regular session of the Legislative Assembly on the work of the Task Force, the department and the commission in designing, implementing and evaluating Pilot Programs."

[24] Issued research report *Technology Development and System Integration for a Vehicle Miles Traveled Based Revenue Collection System Prototype, prepared by Professors David S. Kim and J. David Porter, Oregon State University, College of Engineering* (See appendix D).

- Contracted with vendor AFX Technology Group International Inc. to develop an integrated GPS/AVI device for electronic mileage calculation that would interface with the POS system.
- Negotiated with vendors for development of an integrated odometer/AVI device for electronic mileage calculation that would interface with the POS system.
- Identified a vendor with a product that will allow integration of the prototype devices with most, if not all, major service station POS systems.
- Completed a draft Test Plan that organized and documented the tests to assess if the technology configurations met defined requirements, specified the protocol for each test, identified the hardware and software to be used for the tests, and the number of times a test is to be performed.
- Identified a test site at OSU to set up a mock service station.
- Obtained test vehicles from ODOT fleet services.
- Obtained a fuel dispenser simulator for use at the test sight.
- Developed and tested software to coordinate information flow and actions between the data collection devices, central database, and POS system.
- Acquired a computer to house the central database.
- Developed and tested the central database for the GPS-based technology configuration.
- Developed and tested communications to the central database from the integration software.
- Contracted with Digital Consulting and Software Services to modify their POS system product (Latitude) to meet the requirements of the technology configurations.
- Established an on-campus laboratory where development and off-vehicle component testing will occur.
- Assembled the integration software for fee processing at service stations.
- Assembled a prototype POS system.
- Obtained on-vehicle VMT collection devices (GPS based electronic odometer, speed sensor electronic odometer, combined GPS/electronic odometer).
- Obtained wireless data transfer devices.
- Completed a successful test of the functionality and interoperability of the technology.
- Determined that the system needs further development before any user testing is realistically feasible.
- Recommended further adjustments of the technology for system debugging and test iterations.
- Successfully completed two test demonstrations of the functionality and interoperability of the system at the OSU campus in Corvallis, Oregon, one on April 16, 2004 with the ODOT project team and the other on May 14, 2004 with the Road User Fee Task Force, the media and members of the public. The test involved driving vehicles containing the mileage counting devices through zones to test differentiation of zones followed by a simulated re-fueling to test application of the mileage fee (a.k.a. VMT fee) at a service station.
- Determined that the system needs further development before the equipment will be "user friendly" enough for application in the Road User Fee Pilot Program with real motorists and service stations.

4.2.2 Administration

An internal ODOT workgroup met weekly throughout 2003-2005 to identify and solve administrative issues. During that period, ODOT's consultant in this effort, HDR Engineering, Inc., developed a design and implementation plan for the Pilot Program. The plan worked

systematically through a number of administrative challenges and developed strategies described briefly in this section.

ODOT worked closely with the Department of Justice to develop administrative rules that will allow participants to not pay the fuels tax and instead pay a mileage fee for the duration of the Pilot Program. Additionally, ODOT applied conceptual administrative processes (i.e. Vehicle Miles Traveled Collected at Retail, known by the acronym VMTCAR[25]) in order to reconcile gasoline tax payments and mileage fee payments made to participating service stations to ensure service stations are held harmless on reimbursement for fuels tax paid. (See Appendix H).

ODOT has now received approval from FHWA to enter into the final stage of the grant agreement, implementation of the Pilot Program.

4.2.3 Motorists and Industry Participation

Ensuring that the user participants in the Pilot Program are satisfied with operational and administrative aspects of the test is important, so that participants will be able to continue to participate through to the end of the program. ODOT held a focus group in Eugene, Oregon to evaluate potential motorists' opinions towards the Pilot concept. (See appendix F.) As a result, ODOT identified a need for additional resources to make technology "user-friendly."

ODOT identified methods for recruiting volunteer motorists and service stations and met with representatives from the Oregon Petroleum Association, Western States Petroleum, American Civil Liberties Union and auto manufacturers to discuss issues related to the Pilot Program.

Eugene, Oregon was initially selected as the site for the Pilot test area. ODOT issued a Request for Information to all service stations in the Eugene area to solicit participation in the Pilot Program. Although interest was expressed from service stations in the area, they were prohibited from participating due to their contracts with the major oil companies. This led ODOT to focus on recruiting independent stations not affiliated with a major oil company. This resulted in moving the test area to Portland, Oregon. Discussions with service station owners and operators in Portland are underway to ensure that the details of the Pilot Program are understandable and acceptable to potential Portland area industry participants.

4.2.4 Funding

In 2004 after the completion of an operational test, the Oregon State University researchers recommended the technology be further developed to improve its ease of use. Accordingly, ODOT applied for and was awarded additional FHWA funding under the Value Pricing Pilot Program in order to ensure the technology will function as required when Pilot Program participants—real drivers, real service station owners, and real service station attendants—use it. With this additional grant, the total cost of the project rises to nearly $2.9 million, including FHWA funding of $2.1 million and the state's portion of $771,000 for the entire six years until project completion.

[25] VMTCAR is described in Section 3.3.7 of this report.

4.2.5 Timeline 2003-2007

Key milestones for the period from 2003 to 2007 are outlined below.

March 2003	Road User Fee Task Force, administered by ODOT, recommends to the Oregon Legislature and ODOT a mileage-based fee for testing in a pilot program.
May 2004	ODOT and OSU successfully test on-board equipment that counts and communicates mileage so that gas stations can collect information and deduct the gas tax while adding the mileage-based charge.
Summer 2005	A pre-pilot using 20 vehicles will test the VMT collection, zone differentiation and data reading elements of the program.
Fall/Winter 2005	Recruitment of volunteers for the Pilot and equipping cars with on-board equipment begins in Portland, Oregon.
March 2006–2007	The Road User Fee Pilot Program commences with approximately 300 vehicles.
Summer/Fall 2007	Final report written and recommendations made to the Oregon Legislature and ODOT.

4.3 PUBLIC INVOLVEMENT AND INTEREST

4.3.1 Public Involvement

The Road User Fee Task Force held five meetings in 2003-2004. All meetings were open and announced to the public through news releases and the ODOT website. Additionally, ODOT has received hundreds of phone calls and email from interested people across the country nation and around the world. Every attempt is made to respond to every inquiry within two days. Most frequently mentioned concerns include privacy, tax fairness, cost, administrative complexity and encouraging vehicle fuel efficiency.

4.3.2 Media Interest

The Road User Fee Pilot Program was the focus of numerous news articles during the period from January 2003 to June 2005. Although some reports accurately reflected the project, many others contained factual errors and mischaracterizations of Oregon's mileage fee concept in general and the Pilot Program in particular. Several national reports were written without ever talking with officials at ODOT. Although a complete listing of media reports and commentaries is impractical to assemble, ODOT has noticed reports made by the following news organizations:

The Associated Press
CBS Evening News with Dan Rather
Newsday (New York City)
CNN Money
Newhouse News Service
Gannett News Service
The Washington Times (Washington DC)
MSNBC News
The Osgood Files (CBS Radio Network)
Washington Post (Washington DC)
The Wall Street Journal
The Financial Times

Philadelphia Inquirer (Pennsylvania)
National Public Radio
Boston Globe (Massachusetts)
The Detroit News (Detroit, Michigan)
St. Paul Pioneer Press (Minnesota)
The Atlanta Journal-Constitution (Georgia)
Atlanta Business Chronicle (Georgia)
Asheville Citizen-Times (North Carolina)
The Kansas City Star (Missouri)
CBC Radio (Canada)
Salt Lake Tribune (Utah)
BYU NewsNet (Utah)
Great Falls Tribune (Montana)
The Economist
Road & Track
Los Angeles Times (California)
Sacramento Bee (California)
San Francisco Chronicle (California)
KXTV (Sacramento, California)
Ventura County Star (California)
The Mercury News (San Jose, California)
Pasadena Star-News (California)
San Diego Union-Tribune (California)
KESQ News Channel 3 (Palm Springs, California)
The Seattle Times (Washington)
Seattle Daily Journal of Commerce (Washington)
King County Journal (Seattle, Washington)
The Daily News (Longview, Washington)
The Columbian (Vancouver, Washington)
The Register Guard (Eugene, Oregon)
Corvallis Gazette-Times (Corvallis, Oregon)
Springfield News (Springfield, Oregon)
Portland Daily Journal of Commerce (Oregon)
KVAL 13 (Eugene, Oregon)
Democrat-Herald (Albany, Oregon)
Daily Journal of Commerce
The Oregonian (Portland, Oregon)
The Bend Bulletin (Bend, Oregon)
The Statesman Journal (Salem, Oregon)
Roseburg News Review (Roseburg, Oregon)
Grants Pass Daily Courier (Oregon)
Bulletin (Bend, Oregon)
Central Oregonian (Prineville, Oregon)
Daily Courier (Grants Pass, Oregon)
Herald & News (Klamath Falls, Oregon)
The Lakeview Examiner (Oregon)
Herald (Baker City, Oregon)
Siuslaw News (Florence, Oregon)
Willamette Week (Oregon)
Valley Times (Milton Freewater, Oregon)
Graphic (Newberg, Oregon)
Western World (Bandon, Oregon)
Coquille Valley Sentinel (Oregon)
KATU TV News (Oregon)
KGW (Oregon)
KXL (Oregon)
Roads & Bridges
Governing Magazine
Government Technology
Cybercast News Service
Inside ITS
TollTrans
Toll Road News
GPS World

4.3.3 Inaccuracies in Media Coverage of Oregon's Mileage Fee Concept

In the many media reports focusing on Oregon's mileage fee concept, frequent inaccurate statements are made when describing the technology and policy underlying it. The three issues most often represented inaccurately relate to privacy, a perceived potential for the mileage fee to undercut moves toward more fuel-efficient vehicles, and the characterization of the mileage fee as a "new tax," although by statute and design it is a replacement for the fuels tax on gasoline.

- **Privacy**
  Media reports often assume the Oregon concept includes tracking motorists' movements. In fact, the mileage-counting device in cars simply tells the odometer which zone to record the miles driven in. This is necessary to prevent Oregonians from being charged for miles driven outside the state. No location data is stored in the device or elsewhere;

since vehicle location data is not collected, it cannot be accessed. The only datum collected and transmitted is the mileage, sent to the gas pump reader through a radio frequency that will travel only about eight to ten feet. Should ODOT identify unauthorized uses of the mileage data, policies will be developed and put in place to protect travelers' privacy rights.

- **Rewarding Fuel-Efficiency**
  Media reports often charge that if a mileage-based fee were to replace the fuels tax, the result would be to discourage the purchase of fuel-efficient vehicles. This assumes the mileage fee would be implemented as a flat fee on miles driven with the result that operators of low fuel efficiency vehicles would be rewarded and operators of high fuel efficiency vehicles would be penalized. This is not necessarily the case because the legislature would have the opportunity to structure the mileage fee in such a way to take into account external factors such as environmental factors.[26] For example, the mileage fee can be designed to increase the monetary reward for use of fuel-efficient vehicles. This option might be considered, since studies show that although all passenger vehicles, regardless of weight, inflict approximately the same amount of damage to the roads, vehicle and fuel types vary greatly with respect to the amount of total environmental damage they cause.

  However the rate is structured, the mileage fee would immediately affect driving behavior by directly connecting road use with the motorist's road revenue obligation—the mileage fee would serve to reward less driving. Furthermore, even if structured as flat, the mileage fee itself would not eliminate existing (and increasingly strong) market signals to consumers to make fuel-efficient decisions when purchasing vehicles. At current prices, the state fuels tax is only about 10% of the cost of fuel. Finding the balance between a straightforward mileage-based system of paying for roads and taking into account environmental impact will be an issue for the legislature if the mileage fee is ultimately adopted for statewide implementation.

- **A Gasoline Tax Replacement, Not a New Tax**
  The charge from the legislature to the Road User Fee Task Force was "to develop a design for revenue collection for Oregon's roads and highways that will replace the current system for revenue collection." The mileage fee is in no way intended or designed as a new tax for Oregon.

4.3.4 National Interest

ODOT has received numerous inquiries from other jurisdictions on the development of the mileage fee concept. In particular, the California Performance Review specifically stated that California should develop and implement a pilot and review Oregon's efforts on the matter. The Puget Sound Regional Council in Washington State is also conducting a Pilot Program that has some similarities. The United States Congress is considering implementing its own Pilot Program to study mileage fees.

[26] Policy options for fee structures are described in Section 3.4.2 of this report.

- **California Performance Review**
  The California Performance Review Commission conducted a complete look at California state government at the direction of Governor Schwarzenegger with the ultimate goal of restructuring, reorganizing and reforming state government to make it more responsive to the needs of its citizens and business community.

  One of the recommendations in the infrastructure section states:

  > *"The Secretary of the Business, Transportation and Housing Agency or its successor should develop and implement a pilot project to test the feasibility of implementing a user fee based on actual individual use of the transportation system for funding future operations, maintenance and improvements to the transportation system. Vehicle miles traveled should be considered. The Secretary should review efforts by the Oregon State Department of Transportation to implement a pilot project for a user fee based on actual miles traveled." – www.report.cpr.ca.gov/cprrpt/issrec/inf/inf15.htm.*

- **Puget Sound Regional Council Traffic Choices Study**
  The Puget Sound Regional Council is conducting a pilot project that is similar in some aspects to Oregon's Pilot Program. In this pilot, on board "meters" will be placed in the vehicles of voluntary participants. Different prices per mile will be imposed depending upon the location and time of travel. Drivers will be made aware of the pricing both through maps and other printed material, as well as a real-time read-out on the in-vehicle meter. At the start of the pilot, participants will receive a billing account with a positive cash balance. Any cumulative in-vehicle meter charges will be debited against this balance. Any funds remaining in the account at the end of the pilot may be kept by the participants. This "hold-harmless" study design gives participants the opportunity to participate without committing their own funds, yet gives them the incentive to adjust their driving behavior in order to keep the surplus remaining in the account at the end of the study.

- **Federal Pilot Program**
  The US House of Representatives passed H.R.3 known as the "Transportation Equity Act: A Legacy for Users" that mandates the Secretary of Transportation conduct a national pilot project to assess how intelligent transportation system technology can be applied to assess mileage-based road user charges for the purposes of collecting revenues for the Highway Trust Fund. A report must be presented by June 2009. Included was an allocation of $1,000,000 for each of fiscal years 2005 and 2006 and $3,500,000 for each of fiscal years 2007, 2008, and 2009.

4.4 PRESENTATIONS

Throughout 2003-2005 ODOT officials delivered numerous presentations on the Road User Fee Task Force's mileage fee concept and on the Pilot Program. These presentations are summarized below, beginning with the most recent.

- **National League of Cities Transportation Infrastructure Committee**, Rochester, Minnesota, May 20, 2005

- **International Bridge, Tunnel and Turnpike Association Annual Meeting**, Toronto, Canada, May 16, 2005
- **2005 Oberstar Forum on Transportation Policy and Technology**, Minneapolis, Minnesota, April 18, 2005
- **Alternative Fuels Conference**, Irvine, California, March 3, 2005
- **Oregon Highway Users Alliance**, Salem, Oregon, February 15, 2005
- **Oregon House Transportation Committee**, Salem, Oregon, February 9, 2005
- **ITS Oregon Annual Meeting**, Portland, Oregon, February 1, 2005
- **Transportation Research Board Annual Meeting**, Washington, D.C., January 13, 2005
- **Association of General Contractors/WSDOT Annual Meeting**, Fircrest, Washington, January 6, 2005
- **California Self-Help Counties Coalition**, Focus on the Future Conference, Palm Springs, California, November 16, 2004
- **Central Oregon Area Commission on Transportation**, Redmond, Oregon, November 9, 2004
- **Petroleum Association of Oregon**, Tualatin, Oregon, October 13, 2004
- **Oregon Transportation Commission**, Newport, Oregon, September 30, 2004
- **Wisconsin Transportation Builders Association**, Madison, Wisconsin, September 21, 2004
- **American Association of State Highway and Transportation Officials**, Philadelphia, Pennsylvania, September 20, 2004
- **National Conference of State Legislators**, Salt Lake City, Utah, July 22, 2004
- **Oregon Legislative Joint Committee on Transportation, Trade and Economic Development**, Fairview, Oregon, March 10, 2004
- **Transportation Research Board Committee for the Long-Term Viability of the Fuels taxes for Transportation Finance**, Irvine, California, March 8, 2004
- **"Partnerships in Transportation: The Northwest Transportation Conference,"** Corvallis, Oregon, February 12, 2004
- **Presentation to USDOT Staff**, Washington, D.C., January 15, 2004
- **Transportation Research Board Annual Meeting,** Washington, D.C., January 13, 2004
- **Oregon Highway Users Alliance**, Newport, Oregon, November 14, 2003
- **Washington Transportation Commission**, Olympia, Washington, August 18, 2003
- **Transportation Research Board's Mid-Year Meeting**, Portland, Oregon, July 17, 2003

CHAPTER 5
OBSERVATIONS AND FINAL THOUGHTS

Before long, Oregonians will come to realize the state gasoline tax is failing its original purpose of funding Oregon's road system. A majority of the motoring public will soon obtain and operate newer, highly fuel efficient vehicles and will pay less and less gasoline tax per mile, over time, as the marketplace responds to ever higher gasoline prices. As a result, revenues generated will become insufficient to maintain the road system. At some point, Oregon and, in fact, the nation will need to shift to a different revenue mechanism, something more reliable, if the road system is to survive.

Transition to a new road revenue system will not be easy. Most people are not fond of change and many actually fear it. Working through the policy issues, managing public sensibilities and attaining public consent (if not consensus) will take a significant amount of time, perhaps as much as a decade. Given this needed lead time, it is incumbent upon policymakers to start this effort early—now, in fact—so that the new system can be implemented before the road funding situation becomes an emergency.

Oregon's Road User Fee Task Force has concluded that the best approach for replacing the per-gallon tax is a per-mile charge—the mileage fee. After 3 ½ years of technical research and policy analysis, the Task Force and ODOT staff present a mileage fee system that is administratively and technologically feasible, affordable and more reliable revenue-wise than the gasoline tax. As a practical alternative to the gasoline tax, this new mileage fee system could become the foundation for a new road revenue system for Oregon and the nation.

Critics often make inaccurate claims about the Oregon mileage fee concept, citing invasion of privacy, added taxation, unfair taxation, excessive cost, complexity—all generated by unfounded assumptions. The propagation of inaccuracies over new ideas must be expected and weathered as a necessary hurdle in modern policymaking. The Oregon mileage fee concept, as refined and tested over the past several years, resolves every issue generated by these reactionary claims—carefully, effectively and simply.

As demonstrated in this report, the Oregon concept is workable and practical, a genuine alternative to the gasoline tax. Other creative alternatives may, in time, be devised that provide intriguing additional possibilities. Whichever alternative ultimately proves to be best suited to meet the transportation needs of Oregonians, it is no longer debatable that *some* alternative needs to be selected and implemented. The gasoline tax must eventually be replaced. The Oregon mileage fee concept is one viable possibility in this quest.